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DIFFUSION OF ORGANISATIONAL INNOVATIONS

LEARNING FROM SELECTED PROGRAMMES

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Diffusion of Organisational Innovations

Learning from selected programmes

by

Annika Steiber & Sverker Alänge

Foreword

A big challenge for VINNOVA and public innovation agencies in other countries is how we should design programmes that can increase innovativeness among existing companies. Therefore we commissioned this study to get an overview of interesting initiatives globally to learn from. As we know that this can be of interest for other agencies as well, we decided to share what we learned through this report.

This report is expected to be of interest to government agencies and other organisations with a mission to support business to achieve increased competitiveness. This applies particularly to those who are considering launching or already are operating larger-scale systematic organised efforts in the form of programmes designed to effectively reach out to many businesses.

The content in the report is based on descriptions and analyses of seven programmes selected among two hundred identified programmes around the world. The selected programmes aim to contribute to improved management practices, in most cases in the form of more or less clearly defined organisational innovations such as Lean Production or different models for Innovation Management.

The design of the study builds on research-based knowledge on how organisational innovations are disseminated, adopted and utilized by organisations. The differences between organisational and technological innovations are of great importance and have a bearing on the design of programmes and their actions. Among issues covered in this report are how to initiate sustained change processes in a company and how to scale programmes from pilot projects to broad national impact.

Our hope is that the report's analysis and its descriptions of the seven selected programmes will contribute to better understanding and inspire the development of new and existing programmes aiming at developing industry practices by disseminating organisational innovations.

We especially want to thank the representatives from the selected programmes for all time spent on responding to questionnaires and participating in interviews. We would also like to thank both authors for a job well done and inspiring feedback seminars.

VINNOVA in June 2013

Klara Adolphson
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Authors´ foreword

Over the last years both public and private initiatives have resulted in programmes for the development of innovation capabilities in industry around the world. During our research on the "Diffusion of Organisational Innovations" we met many individuals who were deeply interested and committed to creating or stimulating innovativeness in industry – both practitioners and policy makers. We also identified a large number of interesting programmes aiming at disseminating organizational innovations that contribute to innovativeness.

We started by surveying 200 programmes and gradually identified seven programmes for in-depth analysis. There were more programmes that we found interesting but these seven programmes were selected based on that they could provide different and complementary insights into how to design dissemination processes in practice.

Some of the most interesting programmes were designed as learning processes, i.e. there was an awareness of that it is impossible to know everything from the start and thus the programme design and dissemination process were consciously developed over time. The comparison of programmes identified that based on experiences of what works in practice, some practices had evolved in a similar way across programmes while the individual programmes also provided examples of more unique solutions. It was however hard to find firm data or evaluations of the real impact of programmes. There are various reasons for this lack of information – one is that it is simply hard to measure effects as innovativeness and innovation processes are influenced by many factors. Another reason is that many programmes identified were started relatively recently.

We would like to thank all of you that helped us with information about your programmes – and we learned a lot also from the programmes that were not included among the final seven. And of course, the in-depth study could not have been possible without the help from the designers/administrators/consultants in the seven programmes. In addition to the interviews conducted, we were provided access to evaluation reports, some that even were not yet officially public, and we enjoyed the benefit of each programme reading a draft version of our description of their case and providing us with detailed feedback to make the analysis as correct as possible. So once again our sincere thanks, without your kind and thoughtful assistance, we would not have been able to make this analysis.

To all of you who read this report, we hope that we have managed to convey at least a substantial part of the rich experiences in each of the seven cases and in providing additional insights through our comparative analysis of the cases. For those of you involved in planning or managing dissemination programmes, our hope is that you will get some inspiration to the benefit of your own programmes.

June 2013 - Atherton, CA and Gothenburg

Annika Steiber & Sverker Alänge

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Executive summary

In September 2012, VINNOVA, the Swedish innovation agency, initiated a project called Programmes for Diffusing Organisational Innovations in order to increase current knowledge on the diffusion of this kind of innovations. This was done by identifying and analysing seven different programmes in the world, all of which aim to disseminate organisational innovations in the form of management practices new to the firm. The underlying theoretical framework used in the project is the conceptual model for creation, diffusion, and sustainability of organisational innovations presented by Annika Steiber in her dissertation in April 2012.

In this project, an organisational innovation is defined as 'a new organisational method in the firm's business practices, workplace organisation or external relations'. Further, a 'programme' is defined as an organised system of actors with different roles and responsibilities for diffusing an organisational innovation to and amongst firms and within a firm. The diffusion of an organisational innovation is analysed as how, and at what speed, the organisational innovation is perceived as desired and feasible and then trialed, deployed and sustained by firms and organisations in a specific social system. For an organisational innovation to be considered 'deployed', key stakeholders in a firm need to consciously take a decision to implement the innovation in at least parts of the firm's operations. Commonly, the decision to deploy an organisational innovation is made after some kind of trial of at least components of the innovation. For an organisational innovation to be sustained it means that it becomes part of a firm's normal business practices, workplace organisation or external relations. It might also continue to diffuse internally to new departments and business units and over time it is further refined and complemented by other organisational innovations.

The project was conducted in two main phases. Phase I involved the search for, and identification of programmes worldwide aimed at increasing the innovativeness and competitiveness of existing firms and organisations by diffusing management practices new to the firms/organisations. Methods used by the project team included the use of information from innovation agencies, the project team's own professional networks, social media, and the Google Internet search engine. The search was conducted in six languages in 36 countries. In the first step, 200 programmes were identified and then, through a step-wise process, were filtered down to 28 including a list of 11 prioritised programmes and/or organisations. Of these 11, IMP³rove in Europe, Innovation Engineering System in the USA, Stage-Gate® in Canada, CENTRIM and GrowthAccelerator in the UK, TYKES/Liideri in Finland, and Production Leap in Sweden were selected by the Swedish innovation agency and the project team for in-depth analyses in Phase II. These seven programmes were then further analysed based on primary data collected through interviews and follow-up email conversations and secondary data, such as research articles and programme evaluations. The project team recorded and transcribed each interview, coded the data and entered it into tables,

providing both an overview of each programme and enabling a comparison among the different programmes (appendix 2). Each case was then described according to a structure, which included a summary and sections for background and purpose, uniqueness, results, object and theoretical background, target group and underlying philosophy, geographical scope and programme set-up, metrics, effects, lessons learned, next step, and the project team's reflections.

The data from the seven programmes indicated a number of interesting things. First, the programmes were influenced by, and path-dependent of, knowledge and experience from previous programmes. Further, the programmes were, in themselves, organisational innovations that had been continuously refined and re-invented due to learning processes among stakeholders in the programme. Programmes for disseminating organisational innovations were also found to require an emphasis on education and training of both end-clients and other target groups such as consultants (diffusion mechanisms). This was also obvious in the case of Production Leap in which the innovation 'Lean Production' are well standardised. In the case of 'Innovation Management', the organisational innovation is less standardised and will therefore need continual adjustment (innovation) and local standardization in each company. Hence, there is a need for education and training that enable local innovation and standardization of the object itself.

A number of issues could have influenced the programmes' specific design and content. Among these issues are the overall purpose, scalability requirements, and the age of the programmes. However, it was also found that external factors, such as government vision and policies, competitive threats, a nation's financial situation, and the local institutional set-up, influence the programmes.

Most programmes focused on SMEs because they were thought to be the primary base for growth, while also lacking resources, skills, and finances to conduct change projects by themselves. However, some programmes had also focused on larger corporations and governmental departments, and the data indicates that both these segments act as important diffusion channels to SMEs. Typically, the 'objects' diffused could be viewed as methods and tools for analysis and implementation of the organisational innovation. These methods and tools were surprisingly similar among the programmes with regard to the inter-firm and early phases of intra-firm diffusion processes, with one exception: TYKES/Liideri. Further, the objects were found to be trajectories, rather than static objects.

Great emphasis was generally placed on the conceptualization of the objects, and some of the programmes had invested in protecting them legally by trademarking. Most commonly, the programmes provided some opportunity to observe, test, and even evaluate the new management practice. Some of the programmes had invested in standardised deployment processes, and one of the cases strongly emphasised the development of the object after deployment, which could support the sustainability of the solution. Most programmes had standardised their work methods and tools but provided flexibility in the detailed outlining of the firm solution. The content of the

programmes came from either a research-based or practitioner-based solution. However, currently all of the programmes ended up being based on both perspectives.

The organising structure of all programmes starts in a smaller unit of a few partners being responsible for the development of the content and the processes of reaching end-clients. If the programme is intended to impact many companies, it has to find ways to reach these companies, and this is typically accomplished by working together with local or regional partners who can have direct person-to-person contact with potential end-clients. Some programmes are designed to scale while others are not, even if they have the goal of broad impact. However, sometimes there are parts that could easily be redesigned to scale. There are ways of scaling up through the training of consultants combined with an accreditation process for quality assurance. Most programmes use training combined with accreditation, however, training time differs to a large extent. Almost all programmes used some kind of learning networks with peer-to-peer mechanisms for learning, but the outcome varied considerably. Reasons seem to be the variation in the management of online networks and in the experience and training of facilitators in offline networks. In successful cases, the facilitator of offline networks was considered the key to success, and potential facilitators were selected based on considerable experience in combination with thorough training and accreditation in facilitation. Feedback from clients concerning coaching experiences was also considered an important way for the programme to secure quality.

Most programmes followed a standard design of dissemination steps by first creating an awareness activity, which also served to identify potential candidates. To increase both engagement and competence level, almost all programmes used different kinds of training activities. Some emphasised the strength of visualizing both during the engagement and the deployment phases. Contracting stood out as something that the various programmes valued differently. Two programmes characterised ‘contracting’ to clarify ground rules and mutual demands and expectations as one of the most important factors for success. The impact of interventions in the Innovation Management field is difficult to measure and to analyse. Most programmes are evaluated continually, but the impact in terms of turnover and profit is difficult to link directly to programmes. Instead what is usually measured are programme activity measures in relation to programme goals, innovation measures, or some kind of qualitative data from participants concerning their perceptions of impact on key areas, including culture, strategies, and directly on skills for innovation.

The external world has influenced all programmes, and often served as an important early eye-opener or sometimes more like a consistent lobbyist. In the cases analysed, external influence was based on perceived competitive threats and a view that existing SMEs need support to develop new capabilities and thrive.

Finally, the conceptual model for how organisational innovations are created, diffused, and sustained was valid when analysing the seven programmes. However, the analysis of the seven programmes provided some new aspects that could be useful to consider in a future theoretical model. Some examples of these aspects were the emphasis on the

step ‘contracting’ in the intra-firm diffusion process and the important role local governmental organisations, non-profit organisations, as well as other ‘connectors’ such as financial advisors and lawyers, could have in the diffusion of organisational innovations.

1 Background

The Organisation and Management (*Arbetsorganisation och Ledning*) department at VINNOVA funds research and programmes focused on new or improved management practices. These initiatives have contributed to the generation of new knowledge and positive effects in participating companies. However, there is a need to further understand and capture knowledge on how new management practices (here referred to as organisational innovations) diffuse, both in regard to inter-firm (to a firm and between firms) and intra-firm (within a firm) diffusion. This is especially important because, although research has shown that organisational innovations are essential for firms' long-term competitiveness, there is still less research on the diffusion of organisational innovations than on technical innovations, and hence, less understanding of what could affect the diffusion processes of organisational innovations.

For this reason, the Organisation and Management department initiated a project called 'Programmes for Diffusing Organisational Innovations' in September 2012. The main purpose of the project was to build further knowledge in the area of how organisational innovations diffuse by applying a conceptual model on the creation, diffusion, and sustainability of organisational innovations (Steiber, 2012) to the analysis of current programmes that aim to disseminate, new to the firm, management practices for increased competitiveness to existing firms and organisations.

The project is partly a result of VINNOVA's intention to change its position from a funder of demand-driven research to an innovation agency that more directly promotes innovation by connecting actors, catalysing innovation processes, and stimulating innovativeness (for definition, see appendix 1). The project will specifically provide input in regard to the design of future programmes for disseminating organisational innovations with the aim of increasing competitiveness of Swedish firms and organisations. The project, however, also provides insights not only to the Organisation and Management department at VINNOVA, but also to other departments at VINNOVA and to other innovation agencies that want to develop and refine programmes intended for the development of SMEs, large corporations, non-profit organisations, and organisations in the public sector.

The report includes findings from both Phase I and Phase II of the project. Phase I was reported in November 2012 in a separate work report to VINNOVA (Alänge & Steiber, 2012).

2 Theory

2.1 Underlying theory

The underlying theory used in this project is the conceptual model for the 'creation, diffusion, and sustainability of organisational innovation', developed and presented by Annika Steiber in her dissertation in April 2012. The dissertation (Steiber, 2012) proved two main contentions. First, characteristics affecting the diffusion of technical innovations are valid also when studying the diffusion of organisational innovation, but due to organisational innovations' intrinsic features (compared to technical innovations), some modifications of the conceptual model for studying organisational innovations are needed. Second, the creation, diffusion, and sustainability of organisational innovations are three concepts that are intertwined and should not be explored in isolation.

Table 1, below, presents some implications for studying the diffusion of organisational innovations (OIs), due to their specific intrinsic features.

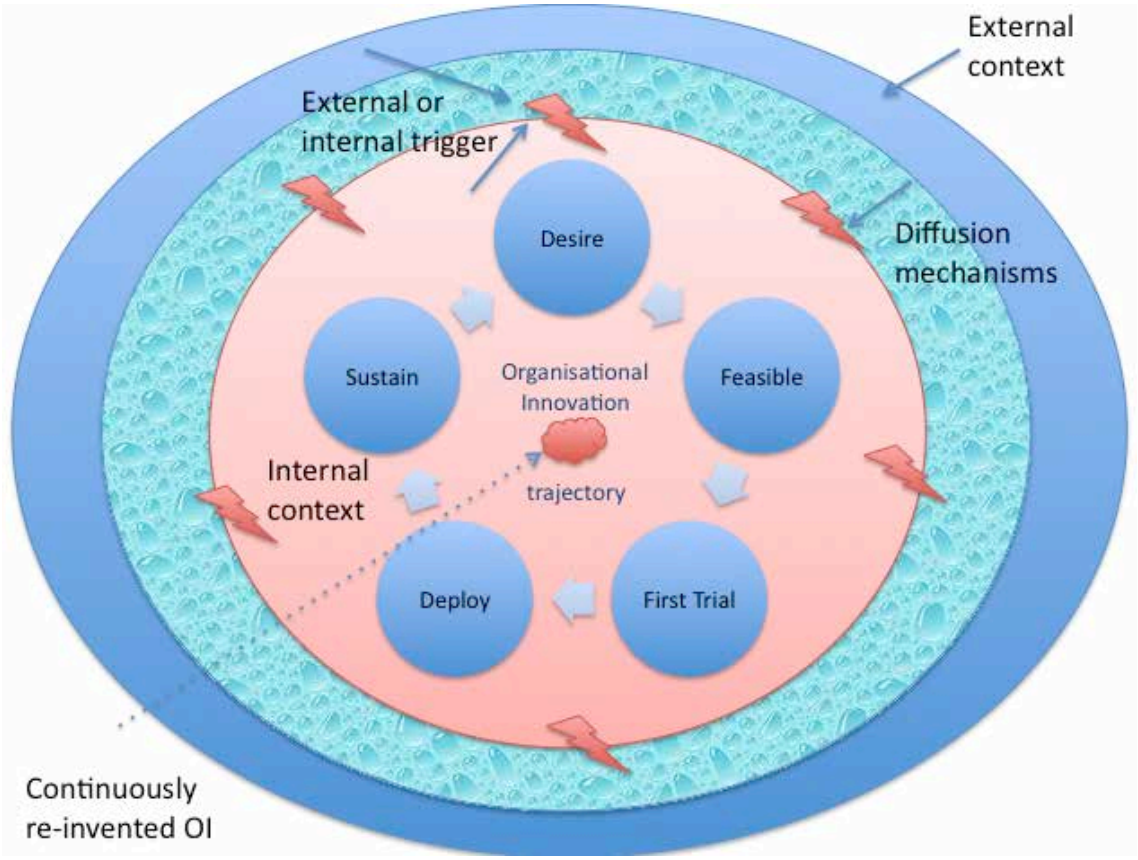
Table 1. Implications of OIs' intrinsic features for the diffusion process

Main implications	Comment
The nature of the innovation	
More difficult to observe, define, and identify system borders for OI than for TI.	Due to the tacit nature of OI, subjective interpretations and continuous re-inventions of the innovation, there is a need to decide when to define the OI in the diffusion process and how to define the OI. Further, there is a need to define when an OI is considered adopted by the firm.
External context	
National systems of innovation are relevant for the inter-firm diffusion process.	The institutional set-up and its inertia and path-dependency, as well as factors influencing its unlearning/learning processes, influence inter-firm diffusion of OIs. In addition, national standardization processes need to be considered.
Other modes of transfer, substituting a traditional market.	The movement of key people between firms, user networks, consulting firms, the institutional set-up and formal and informal individual networks are important alternatives to a 'market' for OI. Regarding networks, factors such as size, dual networks, compatibility of network participants, and the maturity of the network are assumed to play a role.
Internal context	
Path-dependent, cumulative, and non-systematic search and learning processes.	The search and learning processes are not expected to be conscious and systematic until there is a desire for an organisational change. Further, considerable organisational inertia could be expected, which tends to reinforce the cumulative character of OI. Path-dependency, the tendency to lock in to a particular organisational path, is therefore assumed to be stronger for OI than for TI. To break the path-dependency, firms need to unlearn, which in turn depends on user competence.
No traditional financial calculation methods. Alternative decision criteria are needed.	Alternative decision criteria could be: imitation of other successful firms, perceived crisis and/or a strong 'belief' among board members and/or members of top management team.

Main implications	Comment
High costs for transfer and implementation may contribute to delayed adoption of an OI.	Due to OIs' tacit nature it is difficult and costly to imitate an OI. Further, the costs in terms of organisational disruption and specific firm adjustments could be expected to be high. This, together with difficulties of estimating performance of an OI and inertia, is expected to lead to a delay in potential adoption and in extreme cases to entail a crisis.
Standardization of the OI's content and implementation may play a more important role than in the case of TI.	The standardization of content and implementation can make the innovation more observable and testable, reduce inertia and reduce transfer and implementation cost. Further, it can influence the possibility of seeing a national impact from the OI. The standardization can be done by the firm, by national organisations or by consulting firms, for example.
The role of top management is of another magnitude in the case of OIs.	Top management's user competence and commitment in the change process are more crucial for the diffusion of an OI than for a TI.
A need to look at the diffusion of OI in a wider context.	A wider context includes interdependences of innovations. In addition, the technical, social, cultural, and political systems in a firm need to be considered when implementing an OI.

The second finding (that the creation, diffusion, and sustainability of organizational innovations are three concepts that are intertwined and should not be explored in isolation) leads to some interesting consequences. The creation of organisational innovations is partly a result of the diffusion process. An organisational innovation is constantly re-invented in the inter-firm and intra-firm diffusion processes. Also, when an organisational innovation is implemented in a firm, it continues to be re-invented and re-standardised. As a result, studying an organisational innovation as a fixed object was found not to be meaningful. Instead, it should be studied as part of a firm-specific trajectory of organisational innovations. Because the three concepts are intertwined, an alternative conceptual model was developed. This model consists of five important steps that a firm goes through when creating, diffusing and sustaining an organisational innovation (new management practices) to the firm, see Figure 1 below.

Figure 1. A conceptual model for the creation, diffusion, and sustainability of OIs (adapted from Steiber, 2012)



The five steps are: Desire, Feasible, First-Trial, Deploy, and Sustain (for definitions, see appendix 1). In order for the organisational innovation to be diffused to and within a firm, key stakeholders of the firm need to perceive a desire for organisational change, perceive that the innovation is feasible for their specific firm, and be able to evaluate and adjust it and then consciously deploy it in at least parts of the firm. To give any effect on the firm's performance, the firm then needs to sustain the organisational change. Sustain means here that the new management practice becomes part of a firm's normal business practices, workplace organisation or external relations. It might also continue to diffuse internally to new departments and business units and will over time be further refined and complemented by other organisational innovations in order to achieve overall firm goal. Most commonly the further development of the management practice is following a certain path-dependent trajectory, which is visualized as the cloud in the middle of the model.

The five steps are not linear but could be visualised as a circle. The five steps are in turn influenced by four sets of factors: the characteristics of the innovation itself, the internal company context, the external context, and diffusion mechanisms (such as consultants, universities, bridging organisations).

Regarding the characteristics of the innovation itself, Rogers (1995) found that characteristics that affected the diffusion rate were the innovation's relative advantage, compatibility with existing values and past experience, complexity as the degree to which an innovation is perceived as difficult to understand and use, 'trialability' as the degree to which an innovation may be experimented with on a limited basis, and observability as the degree to which the results of an innovation are visible to others. As a result, Rogers found that innovations that are perceived by individuals as having greater relative advantage, compatibility, trialability, observability, and less complexity are assumed to diffuse more rapidly than other innovations.

Regarding the internal context, the top management, as well as the board (Alänge & Steiber, 2009), affects the sustainability of a firm's specific trajectory regarding how to organise to reach firm goals. Top management's own inertia, user competence, and commitment to the organisational innovation trajectory are important in order to limit the internal inertia and resistance towards change. Further, the search and learning processes are cumulative, path-dependent, and even systematic when the desire to change is clearly present. Consultants, bridging institutions, user networks (other companies that adopted the new practice), and other 'diffusion mechanisms' could here play an important role of 'showing' and 'proving' what is desirable and feasible (Alänge & Steiber, 2011). Common triggers are typically a perceived economic crisis, a new market or owner demand, knowledge transfer from consultants, and the previous experience of the management or of the board of directors of the organisational innovation.

Finally, the external context influences the diffusion in form of its institutional set-up, local culture and history, and existing weak ties (Granovetter, 1973) that the firm might have with people outside the own industry and local environment.

3 Method for identifying and selecting programmes

The aim of the first phase of the project was to identify programmes worldwide with the purpose of increasing the competitiveness of existing firms by disseminating management practices new to the firms (here referred to as organisational innovations). The geographical scope of the programmes differed as some programmes focus on only a specific target group within a nation, whereas others have an ambition to cover a larger region, such as Europe.

The programmes of interest for this project focus their efforts on disseminating new management practices to existing companies with more than 50 employees, in other words, not early start-up companies. The programmes should also involve government to some extent in order to be more relevant for VINNOVA, the Swedish innovation agency.

Because the purpose of this project was to study programmes focused on disseminating organisational innovations to existing firms beyond the early start-up phase, programmes primarily having other objectives were not covered in this project. These included programmes creating an incubator environment for start-ups, securing an effective dissemination of technological innovations between academia and the business sector, effectively creating and sustaining clusters or innovative regions, and/or supporting small companies in their internationalization.

'Programme' in this context is defined broadly to include both short-term 'single purpose' programmes and programmes that are part of an innovation agency's more long-term product portfolio.

Identification of programmes

In order to identify programmes within the focus of the project, the following methods were used:

1 Identification of governmental agencies similar to VINNOVA.
   Agencies were identified via:
   - The European Network of Innovation Agencies – TAFTIE
     http://www.taftie.org
   - European Commission Erawatch
     http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/
   - Pro Inno Europe Trendchart
     http://www.proinno-europe.eu/inno-policy-trendchart/page/inno-policy-trendchart
   - Internet search engines

Once identified, the programmes offered or referred to by these agencies were evaluated to see whether they were of interest and within the scope of the project.

2 Sending out email requests in the project team's professional networks.

3 Sending out inquiries via social media, such as LinkedIn.

4 Internet search on Google.

The search was conducted in Swedish, Danish, Norwegian, English, German, and Spanish. More than 200 programmes spread over 36 countries were initially identified. The 36 countries covered the 20 most innovative countries (according to globalinnovationindex.org) and countries such as France, South Korea, Japan, Taiwan, Australia, and the BRIC countries. Finally, some 'innovation rockets' in Europe such as Serbia, Bulgaria, and Latvia and selected countries in South America (based on personal networks) were covered. The following is a list of all 36 countries covered (please note that the 'BRIC' country heading includes four countries):

1 Switzerland
2 Sweden
3 Singapore
4 Finland
5 UK
6 Netherlands
7 Denmark
8 Hong Kong
9 Ireland
10 United States
11 Luxemburg
12 Canada
13 New Zealand
14 Norway
15 Germany
16 Malta
17 Israel
18 Iceland
19 Estonia
20 Belgium
21 France
22 South Korea
23 Japan
24 Taiwan
25 Australia
26 BRIC countries
27 Serbia
28 Bulgaria
29 Latvia
30 Mexico
31 Argentina
32 Uruguay
33 Chile

3.1 The overall selection process

Based on secondary data, each of the initial 200 programmes was briefly evaluated in order to determine whether the programme fit within the scope of the project. Of the 200 programmes, 65 were evaluated as a potential 'good fit' with the scope of the project. Of these 65 programmes, 17 were later found to focus on early start ups (incubators), dissemination of technological innovations, creation of clusters or innovative regions, internationalization of SMEs, or were executive programmes at business schools. These 17 programmes were therefore excluded in further evaluations. As a result, 48 of the initial 200 programmes were selected and presented to VINNOVA on October 17, 2012.

Table 2. 48 programmes of interest for further evaluation

Programme	Programme	Programme	Programme
Production Leap (Sweden)	**CENTRIM (UK)**	**SPRING: Capabilities programmes (Singapore)**	APAC SME Innovation Center (APAC region)
Product Innovation Engineering Program, PIEp (Sweden)	**Workplace Innovation and UKWON (UK)**	**SPRING: Financial Schemes (Singapore)**	**IP4INNO (EU)**
Making Space for Competence, Munktell (Sweden)	**AIM Research & AIM Practice (UK)**	**SPRING: Business Excellence Initiative (Singapore)**	**CEN/TC389-Standards for Innovation Management (EU)**
Verksamhetslyftet (Sweden)	Pera: Pera Training (UK)	**Inno-Gate, Canadian Innovation Center (Canada)**	EFQM- Excellence Model (Europe)
Chalmers Center for Business Innovation, CBI (Sweden)	**GrowthAccelerator (UK)**	Creativity Quebec (Canada)	European Innovation Forum (Europe)
Halmstad School of Innovation (Sweden)	BMWi-ZIM, the Central Innovation Program for SMEs (Germany)	**NIST, Malcolm Baldrige Performance Excellence Program (USA)**	**IMP³rove (Europe)**
Tekes, Tykes/Liideri (Finland)	RKW, the German Productivity and Innovation Center (Germany)	American Institute of Excellence (USA)	**The Hot Spots Research Institute and the Future of Work Consortium (World-wide, based in UK)**
User Driven Innovation Program (Denmark)	**Innovation Lab Initiative (Germany)**	MLAB, the Management Lab (USA)	**ISPIM (World-wide, based in Norway)**
Nordic Innovation-Measured and Managed innovation Program (Nordic)	**Enterprise Ireland-Leadership and management development, Management4Growth (Ireland)**	**The Innovation Engineering System (USA)**	**The Global Gateway to Innovation (World-wide, based in Luxembourg)**
D-School – Design Thinking (Germany)	**Enterprise Ireland-Productivity, Lean Business Offer (Ireland)**	**Enterprise Connect (Australia)**	ENTOVATION (World-wide)
Enterprise Estonia-Development of Knowledge and Skills (Estonia)	**Enterprise Ireland: Workplace Innovation Fund (Ireland)**	Visionary Leaders For Manufacturing (VLFM) programme (India)	Verite (World-wide)
Enterprise Estonia-Management Awareness (Estonia)	**Luxinnovation: Innovation Management, creativity & design (Luxembourg)**	**Small and Medium Business Corporation, SBC (South Korea)**	Management Innovation eXchange, MIX (World-wide)

A second evaluation, based mainly on secondary data, input from professional networks, and VINNOVA, decreased the number of programmes from 48 to 28. These 28, marked in bold above, were then described in a work document delivered on November 6, 2012 (Alänge & Steiber, 2012). At this stage, the programmes were evaluated according to their relevance for an innovation agency, the match between the scope of the

project and that of the programme, and the project team's perception of programmes' scalability and impact.

The work document describes each of the 28 programmes according to the following format:

- Name of programme
- Introduction
- Time period and status
- Objective and geographical scope
- Theoretical and practical background
- Services and activities provided
- Target group(s) and stakeholders – roles and responsibilities
- Evaluations and outcomes
- Links and contact details
- Additional comments

A third screening of the interesting programmes resulted in the remaining 28 programmes being categorised according to five different categories. The categories were (1) programmes that are part of national innovation agencies' product portfolio, (2) time-limited programmes funded and/or run by governments, (3) programmes that form part of research and consultancy organisations' product portfolio, (4) networks/ member organisations partly funded by government, and (5) standardization efforts partly or completely funded by government. Because some programmes in the table above are run by a single organisation such as Enterprise Ireland, these programmes were listed together in the work document under the same organisation.

3.2 Final selection of programmes for Phase II of project

From 28 to 11 programmes

The 28 programmes listed have different characteristics and, hence, different strengths and weaknesses when it comes to disseminating organisational innovations. It is worth pointing out that in many cases, information about programmes was not readily available. In particular, it proved difficult to acquire information regarding the scalability and impact of the programmes. For this reason, several interviews were conducted as early as in Phase I with senior people in the project team's networks or with people identified through communities in social media.

As a result of a further evaluation performed by the project team, 11 of the 28 programmes were selected. The intention behind this selection was that these 11 programmes would serve as primary candidates for an in-depth analysis in Phase II of the project. The programmes selected were Production Leap in Sweden, Liideri/TYKES in Finland, one selected programme from Enterprise Ireland, one selected programme from SPRING, Inno-Gate of Canada, Innovation Engineering System in the United States, GrowthAccelerator in the UK, IMP^{3}rove in Europe, CENTRIM in the UK, AIM in the

UK, and Hot Spots Research Institute in the UK. A brief presentation of the selected programmes follows. A more detailed description can be found in the work document (Alänge & Steiber, 2012).

Production Leap –Approach to diffuse the standardised organisational innovation Lean Production. This innovation turned out to be more complex and now includes more aspects of leadership and learning. The programme has developed learning practices for the programme's own development. It started by targeting existing SMEs in the manufacturing sector, and is now gradually moving into other sectors. The programme has been continually evaluated, and is supported by three Swedish government funds – KK, VINNOVA, and Nutek/Tillväxtverket.

Tekes – Finland's counterpart to VINNOVA has added organisational innovations to its earlier focus on technical innovations. TYKES and Liideri are programmes for workplace innovations involving all personnel and utilizing their ideas in order to create increased productivity. In the case of Liideri, the focus is also to increase firms' innovativeness. These programmes are the only ones that focus on the quality of working life, involve both management and employees, and link this to productivity and innovation. The target group is SMEs that want to grow.

SPRING – A government agency with a broad service portfolio of capabilities programmes and business excellence programmes, all aimed at supporting the development of SMEs in Singapore and internationally. SPRING provides loans and develops differrent approaches to reach SMEs. The agency works through different types of service providers, including chambers of commerce and industry associations. SPRING has created a 'one-door-in' approach to make it easier for all kinds of SMEs to obtain assistance. Innovation and Capability Vouchers are a common form of initial assistance to SME projects.

Enterprise Ireland – A government agency with a broad service portfolio of leadership and management development programmes, as well as productivity/ lean business programmes, all aimed at supporting the development of Irish SMEs in Ireland and internationally (30 international offices). Enterprise Ireland has many standardised programmes tailored to different target groups, including CEOs of larger firms, leaders of SMEs and start-ups. One major focus is to make Irish companies more competitive on export markets.

Inno-Gate – Canadian Innovation Centre (CIC) – a national, not-for-profit organisation dedicated to helping innovators, inventors, and entrepreneurs transform their ideas into market successes. Since its founding 35 years ago, the Centre has provided its expertise to over 20,000 innovators and their companies. CIC has developed a 12-week programme called Inno-Gate, which leads to the development of a customised Innovation Management process for participating companies.

Because the interest for Inno-Gate resulted mostly from Inno-Gate's use of the Stage-Gate® model, Inno-Gate was exchanged for a more focused study of the Stage-Gate®

process and its diffusion in Phase II. In this report, 'Inno-Gate' was therefore switched to the Stage-Gate® process.

Innovation Engineering System – An initiative driven by a co-operation between a private company Eureka!Ranch and the University of Maine through the Innovation Engineering Institute. The purpose is to support organisations in reigniting a culture of innovation through a more systematic approach to innovation. The programme has scaled by cooperating with the NIST/MEP government organisation, and by using existing local infrastructure in the form of local universities, government organisations, and advisors. The programme offers education and training at the Leadership Institute, trials through a 'jump start' programme, and a full-scale deployment programme. Target groups include SMEs, large corporations, universities and colleges and governmental ministries. The approach is inspired by Deming's ideas.

IMP³rove – A European initiative that includes the co-ordinators, AT Kearney and Frauenhofer IAO, as well as national co-ordinators in 10 countries. IMP³rove, which is active in 25 European countries, provides a holistic framework for Innovation Management. SMEs are offered an online self-assessment tool, benchmarking opportunities and facilitation at a workshop. The analysis/benchmarking tool is based on research conducted by the IMP³rove team on best practice in Innovation Management and on a database created as part of this initiative. The analysis and initial support by consultants are conducted through a workshop. The final clients are SMEs, but standardised offerings have also been developed for intermediaries, politicians, academics, and consultants who are trained and can be certified (European certificate). The programme is built to scale, and represents a major EU effort.

CENTRIM – Centre for Research in Innovation Management is a research centre with an objective of increasing the industrial utility of research. CENTRIM creates standardised and managed peer-to-peer learning networks (Profitnet) and has developed a number of audits and a certification process to scale the use of 'tools' developed by CENTRIM through trained consultants. CENTRIM projects such as Profitnet are very carefully evaluated. Initially, the programme was targeting SMEs in regions hit by an economic downturn. Profitnet was initiated by EU funding through local government but is now funded through different sources including non-governmental ones.

AIM – Advanced Institute of Management is a think tank and a mobiliser of putting university research to practical use. AIM consists of AIM Research and AIM Practice, and is reinforced by a recruitment process for AIM fellows where ability to transfer research results to practical use in industry was a criterion for selection. AIM initiated several spin-offs such as Hot Spots Research Institute in the UK and Innovation Lab Initiative in Germany. AIM is a relatively small public investment (£ 25 million) with a relatively large affect. AIM works not only in the UK, but in various other countries, as well. The organization targets practitioners, consultants, and academics. AIM was part of previous UK government's policy on upgrading industry.

GrowthAccelerator – Rapid scaling of standardised approach with a public investment almost ten times larger than that of AIM. It utilises large groups (1,000) of consultants for scaling up. GrowthAccelerator targets relatively young SMEs with a proven growth potential and established capabilities. The programme is a result of lessons learned from earlier regional growth programmes and a major part of present UK government's policy for industrial growth and job creation. It is a large investment, £ 200 million, intended to reach all potential high growth companies in the country (26,000) in three years, to create 55,000 new jobs and 2.8 billion pound sterling in value growth.

Hot Spots Research Institute – Research consortium with an objective of creating dialogue and learning activities with major corporations. In addition, the consortium conducts experiments in online interaction together with client companies, including software/facilitator-based analyses of interaction and development of innovative methods for the feedback of the content and feel of interactions. The research consortium uses 12-month cycles, and is in its fourth round. The primary target group for the consortium's research is multinational corporations. The first round of consortium research in 2001 was funded by a UK government grant for research through AIM. Hot Spots Research Institute currently works with the government of Singapore.

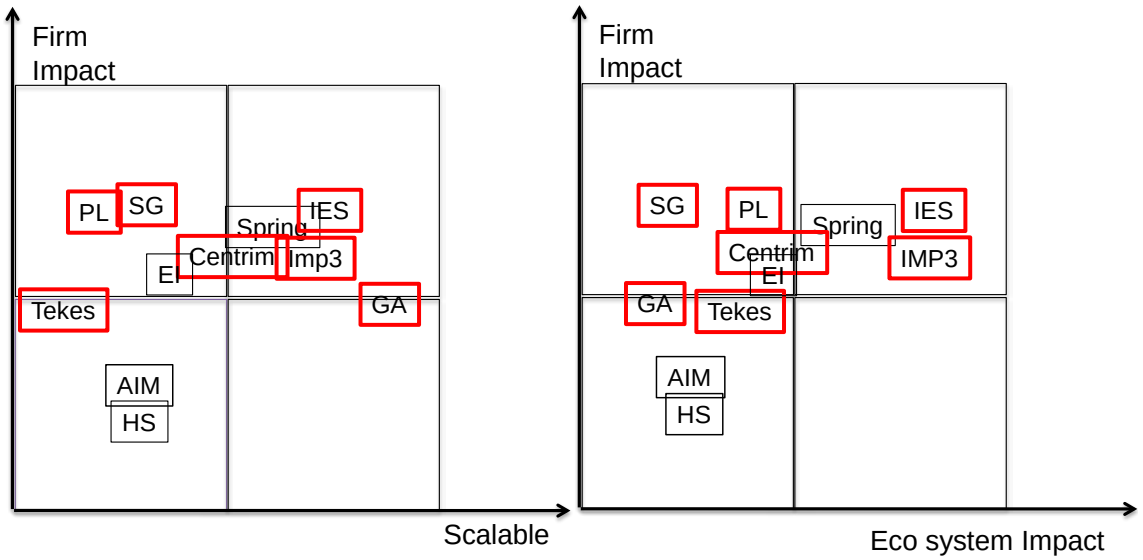
In brief, the selected programmes were similar in three respects. They are meant to increase the competitiveness of existing companies; they all focus on disseminating new management practices; and most of them are directed towards SMEs. They also differed in primarily three ways. They disseminate organisational innovations that have been 'on the market' different length of time and with different degree of standardisation (e.g., rather well established management practices versus Lean Production versus Innovation Management). Some programmes are part of an innovation agency's portfolio rather than being singly funded programmes such as Production Leap and GrowthAccelerator. Finally, some programmes are both focused on developing the eco-system and the individual firm, while other are focused only on developing the individual firm.

Final selection

As part of the presentation, the selected programmes were positioned on a graph according to their firm impact, scalability and eco system impact (for definitions, see appendix 1).

Each programme will now be presented below as positioned on two graphs.

Figure 2 Positioning of selected programmes (based on project team's perception)



Note: EI (Enterprise Ireland), GA (GrowthAccelerator), HS (Hot Spots Research Institute), IES (Innovation Engineering System), Imp3 (IMP³rove), PL (Production Leap), SG (Stage-Gate® process)

As can be seen above, Innovation Engineering System, IMP³rove, CENTRIM, identified programmes by SPRING, and potentially GrowthAccelerator were evaluated as both providing relatively high firm impact and being scalable as programmes. Among these, Innovation Engineering System, IMP³rove, SPRING, and CENTRIM were also evaluated as having a relatively high impact on the surrounding eco-system. Tekes programmes were evaluated as having moderate impact on the firms involved and on the eco-system, but low on scalability. Enterprise Ireland was evaluated as having a rather good impact on firms and some degree of both scalability and eco-system impact.

The Stage-Gate® process and the Production Leap programme was evaluated as having high impact on firms although not currently being scalable. The Production Leap programme was evaluated as having a higher impact on the surrounding eco-system than the Stage-Gate® process.

Finally, the AIM and Hot Spots Research Institute programmes were considered to have a relatively low impact on the firms involved, not being scalable, and having a modest impact on the eco-system. It is important to note that the positioning of the different programmes was initially performed based on secondary data, and was later subjected to a slight re-positioning as a result of the collection of primary data. For this reason the programmes' positions differ slightly between this report and the earlier work document presented (Alänge & Steiber, 2012).

After a joint discussion between the project team and the Swedish innovation agency in late November 2012, seven programmes were finally selected, subjected to satisfactory data accessibility, for a final analysis (Phase II) of programmes for dissemination of organisational innovations. The seven programmes selected, Stage-Gate® process,

Innovation Engineering System, IMP³rove, GrowthAccelerator, CENTRIM, Liideri/ TYKES by Tekes, and Production Leap, are marked in red above. Of these seven programmes, one (TYKES/Liideri) was a programme intended to create organisational innovation through a dissemination process, one (GrowthAccelerator) was a programme to disseminate more conventional management concepts, and five (CENTRIM, IMP³rove, Innovation Engineering System, Production Leap, and Stage-Gate®) were programmes that disseminated a new, more unconventional organisational innovation, which was then further re-invented through the dissemination process.

SPRING and Enterprise Ireland were not chosen primarily because they had expressed hesitation about providing input to the project. They are both agencies offering a multitude of programmes that were, on a programme level, hard to evaluate based on secondary data. In addition, the Swedish innovation agency already has good relations and some information exchange with both these innovation agencies. For this reason the Swedish Innovation Agency asked the project team to focus on the less known programmes mentioned above.

The empirical data collection has been focused on programme level and interviews have been conducted with programme agencies and not with companies being participants in programmes. This means that the focus is primarily on the inter-firm diffusion and on what the programmes do to support the intra-firm diffusion processes in firms.

Finally, this is a non-exhaustive study. Although the greatest care has been taken to identify all programmes of interest, due to the complexity of the search object, there may well be additional programmes of interest not presented here. However, the project team views the selected programmes as a good sample of programmes designed to disseminate management practices, from which important insights on the diffusion of organisational innovations can be derived. The intention was not primarily to identify ‘the ultimate programme’, but to describe and analyse a set of programmes offering various design strengths (and weaknesses). This analysis can provide interesting input not only on how to design effective dissemination processes for organisational innovations, but also on how these innovations diffuse.

4 Case description of selected programmes

This chapter will describe the seven selected programmes in the form of case studies. The cases are not presented in any specific order. The aim is to describe each case in a way that makes it easy to understand. Each case is presented with the following sub titles:

- Summary
- Background and purpose
- Uniqueness
- Identified result
- Object and theoretical background
- Target group and underlying philosophy
- Geographical scope and set-up
- Metrics
- Effects
- Lessons learned
- Next step
- Researchers' reflections

The intent is to present each case from the perspective of the programme stakeholders. Although there is always a risk of bias in conducting this kind of study, describing each case in the words of the programme stakeholders (usually the programme co-ordinators) decreases the risk of presenting a biased account created by the research team. Each interview was therefore recorded and transcribed verbatim, and then used as the 'data' for building each case. The project teams own reflections are written down under the separate heading 'Researchers' reflections' at the end of each case. The individual cases are described below. Please note that the case of Inno-Gate has been replaced by the case of the Stage-Gate® process.

4.1 IMP³rove

Summary

IMP³rove was initiated by the European Commission in its ambition to better support SMEs in Innovation Management and through the expertise of Fraunhofer-IAO and A.T. Kearney, including the latter's experience from the Best Innovator Contest innovation award in Germany. The IMP³rove programme was meant to be scalable from the very beginning, and the development of the programme could be viewed as a step-by-step learning approach. Initially, the IMP³rove team collected knowledge on existing practices and knowledge regarding Innovation Management and then conducted a small

trial in order to later scale up the trial to 1,500 companies representing multiple industries and European countries. The programme was initiated in 2005 but was not made available to all interested parties until 2008. From the very beginning, key stakeholders were identified. These were SMEs, Innovation Management support service providers (IMSSP), financial actors, and policy makers.

Due to the limited knowledge of Innovation Management among the stakeholders, different offerings were developed to various stakeholders by the IMP³rove team. The IMP³rove approach was developed from an online Innovation Management assessment tool and a benchmarking database also to include a consultant-assisted IMP³rove assessment process. This also demanded training and certification of consultants, and the programme demands certified consultants (IMSSP) in order for them to be allowed to use the IMP³rove brand when conducting consultancy assignments. An important part was also a software platform on which tools, research insights, and courses were collected and made available to the IMP³rove community. The parts of this offering that were standardised were the assessment tool, the curriculum for 'training-the-trainers', the assessment system itself (that automatically triggers a follow-up activity), and the IT platform. There was no overall standardisation limited to a few given tools and methods to be used in consultancy assignments. Instead, tools were presented on the IT platform, with direct links to the consulting firms providing them.

Metrics were used on several different levels (from firm level down to project level), and yearly reports were published in which the progress of the programme and insights derived were presented.

The programme co-ordinators frequently collected and analysed data, and the following were some important lessons learned.

The market for Innovation Management services is fragmented. Extensive work needs to be done on the IT platform in order to make it user-friendly and valuable for the users. In-depth training of consultants proved to be crucial. There are constraints in the 'IMSSP' resource with regard to number and knowledge. Success factors for engaging the client are face-to-face interaction, customization of customer support, long-term relationship building and the quality of the consultants. It was also learned that older SMEs are less agile and that the openness to Innovation Management is higher if there are more than 50 employees. The willingness to pay for Innovation Management was found to be low, especially in small companies, and public funding was therefore essential for dissemination. Over time, public consultancy organisations and intermediaries have become more actively involved in IMP³rove. Finally, the IMP³rove team found that systematic Innovation Management leads to higher growth.

Background and purpose

IMP³rove stands for 'Improving Innovation Management Performance with Sustainable Impact'. IMP³rove has been the flagship project of the EuropeINNOVA initiative and has been funded by the European Commission and managed in its first phase by a consortium of more than ten partners. In addition, IMP³rove is represented in the

European standardisation activities (CEN TC 389) on Innovation Management. IMP³rove has been called an innovation platform for SMEs that provides a systematic Innovation Management support. The dimensions in the IMP³rove approach follow the A.T. Kearney House for Innovation and include innovation strategy, innovation organisation and culture, innovation processes, innovation-enabling factors such as HR, knowledge management, IT, and innovation results. The European Commission, DG Enterprise and Industry initiated in December 2005 IMP³rove.

In 2006, IMP³rove conducted an assessment of existing approaches in evaluating Innovation Management and consultancy services to SMEs in this field. The results are documented in the IMP³rove report on European Innovation Management Landscape. The European Commission, DG Enterprise and Industry published in 2006 an assessment of current practices in Innovation Management Consulting Approaches and Self-Assessment Tools in Europe to define the requirements for future best practices, EuropeInnova Paper No. 2 (see www.improve-innovation.eu). Best practice was formulated by developing an online benchmarking platform that allows SMEs to benchmark on a national or international basis within their industry sector, size or age class, and receive a report on how they are performing with regard to Innovation Management compared to the average and the growth champions (Growth Champions are defined as top 10% in revenue, profit, and employee growth in the database). Consulting services were developed to prepare the SMEs for the IMP³rove Assessment, to support them during the benchmarking, and to give them advice on how to close the identified gaps in their Innovation Management capabilities. In 2007, IMP³rove field-test started. It included more than 1,500 SMEs from 25 regions and from a great variety of different industry groups including biotech, pharmaceuticals, chemicals, automotive, space and defence, food and beverages, knowledge intensive services, ICT, machinery and equipment, and plant construction. The benchmarking questionnaire and reports were made available in more than five languages. Consultants working with SMEs were trained in the IMP³rove approach to be able to offer this to their clients. The results of the field test were documented in the second IMP³rove report on Tangible Results from IMP³rove – Insights on Innovation Management in Europe, *EuropeInnova Paper 10*, published by the European Commission, DG Enterprise and Industry in 2008.

In 2008-2009, the IMP³rove programme, now available in eight European languages, was further developed and disseminated across Europe. SMEs can build on a large and up-to-date Innovation Management benchmarking database on SMEs, and get support from more than 500 trained IMP³rove guides (consultants). Policy makers, regions, innovation agencies, and financial actors, according to the IMP³rove team, now have a basis for their decision making related to Innovation Management in SMEs. IMP³rove studies on high-growth SMEs in knowledge intensive services and manufacturing industries provide first-hand information on best practice in Innovation Management consulting and Innovation Management in SMEs. IMP³rove also became available to all interested parties, and at this point in time, had been disseminated beyond Europe (e.g., Canada, Latin America, Australia, North Africa, Middle East, and Asia). Cases are presented in recent IMP³rove studies entitled "*IMP³rove – A European Project with*

Impact – 50 Success Stories on Innovation Management, EuropeInnova Paper 14" published by the European Commission, DG Enterprise and Industry in 2010, "*IMP³rove: High-Impact Innovation Management – Consulting Services for SMEs, Europe INNOVA Paper no. 18"* published in 2012, and "*Gaining Competitiveness with Innovations beyond Technology and Products: Insights from IMP³rove"* from 2011.

The overall purpose of the programme was to provide better support in Innovation Management for small and medium-sized companies (SMEs). The initial intention from the EC was to provide this support through an online assessment tool suitable for SMEs. Over time, the overall purpose has stayed the same, but the means of how to reach the objective have changed. IMP³rove now functions largely as a toolbox for Innovation Management consultants and other Innovation Management professionals in the financial or public sectors.

Uniqueness

IMP³rove is promoted as the European model for developing Innovation Management capabilities at SMEs and at Innovation Management support service providers. It is further promoted as providing a comprehensive suite of Innovation Management support services for the different actors in the innovation eco-system. It currently combines Innovation Management assessment and benchmarking for SMEs with Innovation Management consulting services including training and certification in Innovation Management and Innovation Management Consulting. Many of these services are provided in various European languages. The approach has become part of the first European pre-standard on Innovation Management assessment and it is congruent with the CEN Technical Specification that is currently being developed with the Innovation Management System.

Identified results

Since its launch in 2006, the IMP³rove programme has assessed approximately 3, 500 SMEs. Approximately 500 of these have completed a root/cause analysis as a step following the assessment. The IMP³rove Assessment is sufficient for the SMEs to gain an insight into their strengths and weaknesses in Innovation Management capabilities to develop and implement improvement measures, but the Root Cause Analysis provides the benchmarks. According to the Global co-ordination team, the distribution of completed IMP³rove assessments reflects the size of the economies of the European countries. Therefore in countries like Germany, UK, France, Spain, and Italy, more than 200 SMEs have performed the IMP³rove Assessment, while in countries such as Austria, Benelux or Hungary there have been about 100 SMEs each. About half of the SMEs that have completed the IMP³rove Assessment have been in existence for up to ten years (figures as of December 2012). The number of accredited 'IMP³rove guides' in December 2012 was approximately 500 across Europe and beyond. The majority of these were found in the same countries where most assessments have been conducted. These consultancy firms could be viewed as early adopters of the IMP³rove approach as part of their consulting approach.

In October 2009, the long-term impact of IMP³rove consulting services on SMEs' performance was presented in a report by the global co-ordination team. According to this report, approximately 77% of the IMP³rove-facilitators thought that the IMP³rove assessment helps to quickly identify strengths and weaknesses of the SME. Approximately 74% of SMEs stated that the recommendations developed by the IMP³rove expert had a significant long-term impact on the SME's business; and 60% of SMEs stated that the recommendations had an impact on staff motivation and cultural readiness for innovation in the long run.

Object and theoretical background

Object

The IMP³rove approach aims for a holistic view on Innovation Management. The dimensions covered are innovation strategy, innovation organisation and culture, innovation life cycle processes, innovation-enabling factors and innovation results. Since 2006, the approach has developed from an online Innovation Management assessment tool to a suite of value-creating services, including training and certification that will be continued on a sustainable basis into the future by the IMP³rove- European Innovation Management Academy.

In the beginning the 'object' or the 'IMP³rove Approach' was an online assessment tool and a benchmark database. The idea was that SMEs could and would use this as a self-assessment tool. This first offering was therefore based on a standardised questionnaire. However, it soon became obvious that a self-assessment tool like this would not reach the SMEs. The reason was that SMEs were not yet educated or sufficiently aware of what impact Innovation Management could have on their competitiveness and potential to grow. For this reason, SMEs didn't actively reach out and adopt the tool.

In response, IMP³rove was then enhanced. In this second phase, training, certification, and the assisted IMP³rove Assessment process were added to the existing online assessment tool and the benchmarking database. This IMP³rove benchmarking approach added to the approach developed and used for the 'Best Innovator Contest' launched in 2003 in Germany and managed by A.T. Kearney for larger corporations. Further, the system, in itself, is standardised and automated. It automatically triggers each step of the IMP³rove process from registration, completion of the IMP³rove questionnaires, selection of the benchmarking class, requesting the report, and finally providing feedback about the value-added by the IMP³rove services.

To increase proficiency in Innovation Management and transparency in the Innovation Management consulting market, IMP³rove established an international training and certification scheme that focuses on value adding for SMEs. Part of the IMP³rove services therefore became a standardised curriculum for 'training the trainer' and the various trainer certificates. The curriculum for consultants and certification scheme is based on both practical and theoretical experience. The training programme has been developed in line with the Bologna Process. Options currently exist to become an 'IMP³rove Guide', 'IMP³rove Expert Level 1', 'IMP³rove Expert Level 2' and 'IMP³rove Auditor'. In addition, a high level consulting process has been developed in

which the consultants will be trained once they are interested in gaining better proficiency in consulting (Expert Level 1 and above). Although IMP³rove Guides are accredited to support the SME during the benchmarking process and to provide feedback on the benchmarking results, they are not accredited to provide consultancy services under the IMP³rove brand. In the case the company wishes to take action to close the identified gaps together with a consultant, it must enter into the consulting process that can be supplied by consultants accredited as IMP³rove Expert level 1 or 2 or as IMP³rove Auditor. In some cases, the consultancy services are co-funded by public programmes. An IMP³rove Auditor is accredited to conduct a comprehensive Innovation Management audit of the company's practices. A clear standard is thus in place as to who is providing which services based on what certificates. The first training programme was developed in 2007/2008 and the curriculum and certificate were further developed until 2011. The curriculum includes case studies, demos on the ability to present Innovation Management issues to an SME audience and exams. It is oriented towards the Bologna Process so in the future it could be recognised as the equivalent of a certain number of university credits.

The final identified step in the IMP³rove process development was to develop 'partner services'. These partner services are focused on sharing best practices in IMP³rove-based Innovation Management support, involving the IMP³rove consultants in Innovation Management-related programmes, and facilitating networking between people within the IMP³rove community, for example, through a LinkedIn community.

As a result, the IMP³rove Innovation Management Support Services currently consists of four main components. These are the Assessment tool, IMP³rove training, IMP³rove Partner Services, and IMP³rove Research based on the IMP³rove benchmarking and consultant databases.

Theoretical background

The theoretical background for the design of the first version of the offering was based primarily on the following sources. These were the Innovation Management consulting expertise of A.T. Kearney, the tools and learning from the 'Best Innovator Contest', launched in Germany in 2003 by A.T. Kearney, the expertise of Fraunhofer-IAO from their applied research in Innovation Management and their innovation assessment tool, and a review of current practices in Innovation Management consulting approaches and self-assessment tools in Europe in 2006. The IMP³rove Global Co-ordination Team, consisting of staffs from A.T. Kearney and Fraunhofer-IAO, conducted the review. According to our interviewee, findings from the academic sector were incorporated via the input from Fraunhofer-IAO. General theories that have been used in the IMP³rove approach, especially in consultancy assignments, include Innovation Management, change management, and Brainstorming techniques.

Target group(s) and underlying philosophy

Target groups

The target groups for the European Commission were SMEs, Innovation Management support service providers, financial actors, and policy makers. The definition of SMEs

includes companies with up to 999 employees (N.B. In Germany, mid-sized companies are defined as having a maximum of 5,000 employees). Therefore the IMP³rove size classes are: 0-5, 6-20, 21-100, 101-250 and > 250 employees. In the future, size classes might be expanded to accommodate companies larger than 999 employees. One reason for this is the insight that Innovation Management benchmarking along the value chain will also include larger companies. Currently about 50% of the approximately 3,500 companies in the database have fewer than 20 employees. The main reasons for this are that IMP³rove consultants that were involved in the beginning often worked with start-up companies and that the public programmes, in which IMP³rove was integrated, focused on the smaller SMEs. However, companies with more than 50 employees, who are interested in, and open to, Innovation Management benefit even more from the IMP³rove's services. When a company has more than 50 employees, it makes more sense to have systematic Innovation Management procedures in place, and therefore, their openness towards Innovation Management is often higher than in the case of companies with fewer than 50 employees.

Underlying philosophy

The EC philosophy is that most growth in the number of jobs comes from and through innovative SMEs. The philosophy behind the IMP³rove approach is to build an IMP³rove-driven eco-system in which each stakeholder focuses on the added value resulting from Innovation Management support, and 'speaks the same language' across Europe.

Geographical scope and set-up

Geographical scope

Because the European Commission started the programme, its overall geographical scope was initially Europe. Early on, however, requests from outside Europe for IMP³rove services were accepted. This benefits Europe because it is important and essential to understand what is going on outside Europe in terms of Innovation Management and the competitiveness of SMEs. Interested support providers from outside Europe were therefore allowed to become part of the IMP³rove network. Today, the growth areas outside Europe are Latin America, Asia, and North Africa.

Set-up of programme

The development of IMP³rove followed a clear structure that included three main phases: developing the IMP³rove approach (12 months), testing (15 months), and dissemination (from March 2008) and further development (until March 2012).

Each of the phases had clearly defined milestones and deliverables. The overall aim during the development of the IMP³rove was to create a state-of-the-art approach that built on existing tools and methodologies but that had a clear added value compared to these. The choice selected was an approach that could provide both depth (detailed analysis of various dimensions of Innovation Management) and a holistic approach (systemic assessment). The IMP³rove approach was then tested in several stages before it was made available on the IMP³rove website. In the end of 2006 the first five SMEs were invited to participate in a dry run to test the questionnaire based on a hard-copy

version. In a second test (the pre-test), 85 SMEs tested the approach, including the assessment, in an online version. The question at this stage was whether or not all elements generated the desired result. The third test (the field test) was performed with more than 1,500 SMEs from more than 25 European regions. The aim here was to build the database and refine the approach. With these tests, a solid basis for the dissemination was established. During the field test, the national co-ordinators that were part of the IMP³rove Consortium were compensated for their efforts in recruiting and supporting SMEs in the completion of the IMP³rove process. In the dissemination phase, this financial support was no longer made available. The consequence was that support organisations into whose strategy IMP³rove fit continued to apply it. In addition, other organisations that didn't receive any financial incentives during field testing but already had innovation as part of their business strategies adopted the IMP³rove approach. The dissemination includes a spectrum of different channels. Channels with longer lead times were located mostly in the public sector, whereas the private sector with its shorter lead times seemed more promising. However, once the longer lead times in the public sector were overcome, the dissemination of IMP³3rove could get broader as these channels usually reached more SMEs than did the Innovation Management consultants. The diversity of channels reflects national and regional differences in support programmes and also in the infrastructure available to offer support programmes.

The programme co-ordinators exist on two levels - the global co-ordination team and the national co-ordinators**.** The global co-ordination team is the leader of the IMP³rove initiative and consisted of members from A.T. Kearney and Fraunhofer-IAO (Institute for Industrial Engineering). The national co-ordinators represented IMP³rove in their respective countries. Their responsibility was to develop the IMP³rove network in their country, disseminate the IMP³rove services, and co-ordinate the national activities with the global co-ordination team. National co-ordinators are entitled to co-ordinate different types of national IMP³rove key stakeholders (partners) such as consultants, intermediaries, financial actors, and policy makers.

Key stakeholders were defined from the beginning, and were all included at an early stage in the development of the programme. The first stakeholder is the consultant (supporting SMEs based on publicly funded programmes and those in the private sector). In December 2012 there were 600 'providers' registered. Out of these, approximately 500 are trained as IMP³rove Guides, a few are in the process of reaching the level of IMP³rove Expert level 1 and none so far is an IMP³rove Auditor. The explanation for not having any certified auditors is that it requires a significant investment in time to reach enough practical experience. The other stakeholders are the intermediaries, financial actors, and policy makers. The academic world was not on the radar from the beginning. Universities were instead included at a later stage when the global co-ordination team became convinced that they could build an IMP³rove-driven eco-system that would include clusters, Innovation Management support providers, financial actors, and policy makers, as well as academic institutions, in order to enhance Innovation Management proficiency and competitiveness in this eco-system. Universities that would like to enhance their lectures by practical experience are supported by

the IMP³rove Core Team in applying 'IMP³rove for students' to give them practical experience in Innovation Management, too. Because the curriculum was designed in accordance to the Bologna Process so that pre-requisites are fulfilled, an extended partnership with academic institutions that would include an accreditation scheme might be the next step in the development of the IMP³rove programme.

Design of sub-processes

From its start, the programme was built to be scalable, as well as to secure a high quality and a high impact. According to the global IMP³rove Co-ordination Team, there is no conflict between scale and quality provided there are proper processes in place. In order to better understand the developed processes in the four critical phases—'Train the trainers', 'Engage customers', 'Deploy solutions' and 'Sustain solutions'—each phase and its processes will be presented below.

The first phase, Train the trainer, is conducted with a mindset that consultants should be trained effectively and in a way that ensures high quality consultancy services. The IMP³rove programme offers standardised two-day courses on different skill levels. The consultant or intermediary is step-by-step building up her/his competence in Innovation Management and Innovation Management consulting. These courses are:

- Introduction to IMP³rove approach (Content: the IMP³rove approach to Innovation Management, the IMP³rove benchmarking process, the IMP³rove platform and services for service providers, and preparing for the feedback workshop with an SME)
- Introduction to Innovation Management Consulting I (Content: Identifying Innovation Management issues and gaps of a consultant's client, developing hypotheses as to what could be the right measures, developing conclusions and recommendations, and applying selected consulting tools)
- Introduction to Innovation Management Consulting II (Content: the IMP³rove consulting process designed for SMEs, advanced consulting tools applicable to SMEs, successful introduction of Innovation Management consulting services)
- Introduction to the Improve Auditing (Content: A.T. Kearney House of Innovation, linkage between Innovation Management success and sustainable growth, key performance indicators for Innovation Management, the steps in the IMP³rove Auditing process and their challenges, systematic evaluation of the SME's Innovation Management capabilities, and quality assurance of the IMP³rove Auditing process).

The training curriculum also includes training on innovation strategy (necessary to become certified on Level II and includes content such as elements of, and roadmap for, innovation strategy development) and examinations. The quality of consulting services is maintained through the exams, and other deliverables to be provided as bases for the certificates, as well as by reviewing online feedback collected from SMEs and the consultants after an assignment. The IMP³rove – European Innovation Management Academy, the organisation that will provide the IMP³rove services in the future, is designed as a virtual organisation. The training sessions were initially offered in ten different European countries. In 2013, training sessions are offered mainly in Germany

complemented with a few sessions in Morocco, Lebanon and Egypt. Finally, according to the global co-ordination team, once there is a demand for a wider spectrum of topics in the training programme, experts from academia that agree with the focus on practical impact may well become part of the faculty.

The second phase, Engaging customers, is realised by consultants and intermediaries that already work with SMEs. The relationship between the Innovation Management service provider and the SME is secured beginning with the filtering of the service providers that are to be trained in the IMP³rove approach. In order to be eligible to take a training session, even on the lowest level, the provider has to have at least two years of experience in rendering services to SMEs. In other words, the provider must already have a network of SME clients. This, however, is not enough, as the provider also needs to be currently involved in innovation projects with SMEs and is required to register an SME interested in executing the IMP³rove assessment. However, public programmes, in many cases, have served as the trigger for the SME to conduct an Innovation Management assessment. Other triggers identified have been requests from investors and customers, competition, role models and 'front-runners' (e.g. cluster managers or trade associations) in the SME's business. An example of policy makers creating a trigger was found in Hungary, where companies need to score 100 points to be eligible for funding, and 20 of these can be obtained by utilizing an IMP³rove Assessment report.

The third phase, Deploy solutions, is realised by IMP³rove Guides, certified Level I or Level II IMP³rove consultants, and IMP³rove Auditors. All certified IMP³rove guides, consultants, or auditors are provided a toolbox (tools and methods) for conducting the benchmark/feedback workshop or consultancy assignment. However, although the initial three-day assessment, benchmark and feedback workshop are standardised, consultancy tools and methods used later in potential consultancy assignments are customised to meet the individual needs of the SME. The IMP³rove approach does not require a specific set of consultancy tools but rather aims to seamlessly link up with other tools and methods for each specific dimension of Innovation Management. In this way an opportunity is created to link a consultant's own tools and methods with one or several dimensions of Innovation Management. Currently as a result, the IMP³rove Innovation Management toolbox includes more than 60 tools to be used for the various dimension of Innovation Management. Standardizing tools is not yet in the scope and budget of the project, but the quality of the tools has been checked. The toolbox brings together tool owners and tool seekers. Because of the importance of contextual knowledge about the use of specific tools, the matchmaking is embedded into a regional and sectoral context. Furthermore, there are additional tools available (bringing the total to more than 100 tools) developed by the RWTH Aachen (Technical University of Aachen, Germany) but these additional tools are available only in German.

There is also an overarching consulting process that consultants are to follow. This process starts with the consultant gaining an understanding of the SME's needs before developing a proposal for the consulting services that shows the deliverables and the expected impact. The next stage is the performance of the agreed assignment. After the

assignment is completed, the IMP³rove team asks the SME and consultant for feedback. Identified quality issues are then discussed with the consultants. In the case of an audit, the IMP³rove auditor has to conduct certain procedures according to the instructions but within these, there is flexibility as each SME has different challenges, and thus a need to customise the support services.

Finally, the fourth phase, Sustain the solution, is realised by a follow-up activity with the same SME, 12 months after the end of the IMP³rove assessment/consultancy assignment. In a follow-up email to the SME, the assessment is offered one more time in order to identify the project's impact. It might also be realised by conducting an IMP³rove Audit. The IMP³rove consultants are further supported by the Partner services (such as a LinkedIn community and by IMP³rove various other means of further developing the international IMP³rove network, such as Webinars, meetings, conferences, and workshops).

Metrics

There are clear metrics for the progress of the programme. A monthly performance report, including data such as number of companies, and the industries they are active in, is produced and presented on the IMP³rove website.

The IMP³rove methodology includes clear key performance indicators (KPIs) such as the innovation results. These are revenue, profit, and number of employees. A firm is measured (benchmarked) against others (the average) in the industry (or against specific firms they choose) or against so-called growth champions. Each of these three KPIs is then broken down into sub-KPIs. The KPIs are limited to financials but are related to each part of the A.T. Kearney House of Innovation. They are further related to innovation projects, for example, in order to measure time-to-market and time-to-profit (also including the marketing and sales phases) or budget spent until market entry or number of man-days invested until market entry.

The client's customised action clearly defines plans, targets, and KPIs relevant to the client.

Effects

From the point of view of an SME, value is created if the support leads to increased competitiveness and sustainable growth. The public interest might be new jobs or other types of societal value, such as a stronger innovation network. Ideally, value for both the enterprise and the public interest is created.

The programme had reached more than 5,000 SMEs by end of 2011, and 500 people were trained in the IMP³rove approach in the same period and are accredited as IMP³rove Guides (600 service providers in total are associated with IMP³rove).

The assessment and feedback workshop has been well standardised and requires a three-day consulting investment. The assessment, including benchmarking, is available 30 minutes after the questions have been answered and companies for comparison have been chosen. The completion of the root/cause analysis can be done within two hours.

The assessment is currently free of charge. The cost includes the use of professional services conducted by external consultants, and here the SME negotiates directly with the consultancy firm. In many cases, however, these consultancy assignments are publicly supported through a public sector grant.

Training is a two-day workshop and the tuition fee varies between €1,250 and €1,800 per person, depending on the course. In addition, there is a fee for being certified (e.g., €50 per person for being certified as an IMP³rove Guide, €200 for Consultant Levels I or II, and €500 for being certified as an IMP³rove Auditor). Certifications are valid for two years.

Lessons learned

The lesson learned as early as in 2006 was that the market for Innovation Management support services is rather fragmented and many consultancy firms use their own approaches. A consistent European approach to Innovation Management consulting as well as clear quality criteria was thought to increase transparency for SMEs, policy makers, financial actors and for the consultants themselves. This would then contribute to the professionalization of these services.

The lessons learned after the field test that was completed in 2009 were that in order to further enhance and disseminate IMP³rove, the IMP³rove platform had to become more user friendly in its user management and online assessment procedures. Issues identified were maintaining the client relationship via the platform, providing more detailed classification in the registration form, and offering additional user accounts, especially to key stakeholders such as financial investors. Further, tutorials need to explain basic Innovation Management terminology and additional online help is needed with interactive features and graphic design. An additional questionnaire on sustainability-driven Innovation Management was developed and is now provided also in eight languages.

The IMP³rove process was further enhanced to ensure high-quality data in the benchmarking and to improve the interaction between SMEs and IMP³rove consultants. As a result, the IMP³rove platform was recommended in a report in 2008 to be positioned as an Innovation Management community rather than a platform. Further, a recommenddation was made to include more in-depth training for consultants, make better use of IMP³rove intelligence through a growing database, and make IMP³rove an integral part of higher education curricula. In addition, during the dissemination phase, a major constraint turned out to be the infrastructure providing Innovation Management support services to SMEs. Technology transfer and internationalisation are in many countries well covered by support services offered to SMEs. But these services are different from Innovation Management support. Even if these organisations expand their services, it takes time until SMEs accept this change in branding.

Several new lessons learned have been identified during the IMP³rove project. First, it is possible to build an IMP³rove-driven innovation eco-system. However, the infrastructure of the intermediaries was not initially at a stage that could create value for SMEs. Further, SMEs have to be educated in why they should invest in Innovation Manage-

ment. For this reason, an online assessment without a facilitator was found to have limited impact.

Additional lessons learned were that success factors for engaging customer are face-to-face interaction, customization of support services, long-term relationship building, and the consultant's competence in complex problem solving and value delivery. Funding of innovation projects was found to have its highest impact if it is spent on SMEs that already have an Innovation Management system in place that is linked to the SME's business performance. Because it is not sufficient that the SMEs grow only in revenue and number of employees, but not in profit, the Innovation Management consultant and the SME's management team need to define achievable but tangible goals for Innovation Management, right from the beginning.

Other lessons learned were the importance of a good and uninterrupted software platform and that an Innovation Management system that includes several dimensions usually requires a certain size of the company. When a company has more than 50 or even 100 employees, Innovation Management makes more sense for them and they are more open to this kind of thinking and methodology. In addition, it was found that mature SMEs (> 15 years) are less agile than newer SMEs (2-15 years). Mature and small SMEs that are older than 15 years and have fewer than 100 employees show a much slower growth rate than companies of the same size classes that have existed for 2-15 years. Older SMEs are less active in innovation and achieve a lower income share from innovation across all size classes. Furthermore, they have difficulties in linking their innovation to income growth and profit growth. The global co-ordination team also observed that the intrinsic demand for Innovation Management consulting services is not yet self-sustaining. In fact, demand for professional Innovation Management consulting services for SMEs is still very much stimulated by publicly funded programmes, and the SMEs' willingness to pay for this kind of services was found to be limited. Specifically, small companies are unwilling to pay for Innovation Management consulting services.

The services are offered by both private and public organisations. The trend was found to be that publicly supported organisations become more active and move from awareness-building toward impact-oriented Innovation Management consulting services, a trend that puts privately owned consultancies under pressure to move further to high-value consulting services. Furthermore, the landscape of Innovation Management support covers not only privately owned or public service providers but also intermediary organisations, which have become active in the area of Innovation Management support and consultancy services. In fact, private consultants were found, in a study conducted by the IMP³rove Core Team, to be under pressure as publicly supported consultants and intermediary organisations are changing their services portfolio and actively entering the Innovation Management consulting business. Of the registered IMP³rove intermediaries, 75% consider Innovation Management support services as their main field of activity. The second most important field of activity of these intermediaries is technology transfer. Further, publicly supported intermediaries

showed a higher activity in services for entrepreneurs and start-ups compared to private intermediaries.

Services offered by different actors in the IMP³rove network were found to be everything from Innovation Management consulting services and innovation enablers (HR, KM, IT), to general management consulting services. In addition to these, associated IMP³rove partners present additional fields of activity in their service profile such as special services in Innovation Management, more specially, business modelling or market research. This underscores the diversity of service offerings included in Innovation Management consulting.

Finally, it was found by the IMP³rove Core Team that companies using Innovation Management systematically grow faster and are more sustainable than other companies. In some cases, the difference between a firm using a systematic approach and a firm not doing so could be up to three times in average growth rate. One lesson learned was also that companies with an innovation strategy manage their innovations more effectively and efficiently as they had clear criteria to determine which ideas contribute to their strategy. In regards to enabling factors such as HR, IT, and the like, the most critical ones depend on the specific industry. In addition, empirical evidence was found of the interrelation of a systematic and holistic approach towards Innovation Management and profitable growth. One of the key prerequisites for a systematic Innovation Management is an innovation strategy to guide a firm's innovation activities. A large majority (70%) of SMEs have neither developed nor documented an innovation strategy. SMEs also regularly struggle with systematically managing the front end of the innovation life cycle covering the generation and selection of new ideas.

Next step

The past success of IMP³rove as a programme encourages the taking of the next step to developing the approach into a sustainable business offering on a non-profit basis. The intellectual property rights developed during the programme and mainly owned by EC are therefore intended to be transferred to a new organisation that will continue to offer the services under the brand IMP³rove. License fees and other revenues will finance further development of the services. The intention in this phase is also to scale up.

In addition, a potential need for future development of the IMP³rove process was identified. The reason for this is concepts such as 'Open Innovation' and 'Need/User-driven Innovation' that have become emphasised after the launch of the IMP³rove approach. The IMP³rove approach might therefore incorporate these new insights and thus continuously improve IMP³rove according to the IMP³rove Co-ordination Team.

Researchers' reflections

IMP³rove has a high ambition level and has been presented as the 'flagship project of the EC's EuropeInnova initiative' for improvement of Innovation Management of SMEs in Europe. The initial project has primarily been funded by the EC and the aim was to upgrade competence in Innovation Management not only among SMEs (with up to 999 employees) but also among other stakeholders. However, one experience has

been that it is difficult to attract smaller SMEs to IMP³rove's products and services and larger companies therefore also need to be included as a target group. This also seems to have implications for IMP³rove's business model, as private consultants that were planned as a major diffusion mechanism, have had difficulties marketing their services and hence, seem to be less interested in working under the IMP³rove umbrella. The relatively low number of consultants trained as IMP³rove primary level experts indicates that the programme has not yet found the right formula (in December 2012 there were more than 500 IMP³rove Guides trained – a two-day training programme – but only a few on the initial level of official IMP³rove experts – another two-day programme). This was also evident from the increasing relative importance of public organisations as IMP³rove actors and the comment about the need for more public funding for small SMEs. In a way, this is not a surprising finding, because similar experiences exist in most parts of the world, which is evident in different means to facilitate the access to initial consultancy through public financing of initial offers (e.g. the Innovation & Capability voucher in Singapore). However, it is essential to further investigate possible incentives for private consultants to upgrade commercially and in terms of competence in relation to SME customers (i.e., not only to provide access to consultancy services for free through public money). The initial cohort of 1,500 companies participating in the project was financed by public means and could participate without paying a fee. However, in the future, someone has to pay for consultancy services, and it is doubtful that smaller companies will be willing to pay unless they get at least some public support to cover the costs of consultants.

Another reason for IMP³rove's difficulty in attracting smaller SMEs could be that IMP³rove offers a relatively complex product, which fits larger companies better. IMP³rove indicates that companies with more than 50 employees benefit more from a systematic Innovation Management approach. Other programmes offer products/ services specifically targeted to smaller companies or even micro-companies (e.g., CENTRIM). Every programme must make a decision on which segment to focus on, depending on its specific purpose.

However, the question still remains whether IMP³rove will succeed in its efforts to scale and upgrade consultants through its training and certification process. The aggregate investment in time to train to become auditor is only eight days (in comparison, Production Leap training is ten days) although between each training session there is a demand to gain experience on current level before advancing to the next one. If there is limited demand for the services, this could be a barrier. Nevertheless, the training and certification process is one way of upgrading consultant competence, but unless there is an incentive in terms of a good market demand for services, it might be necessary to train consultants in direct connection to publicly funded programmes where their services are in demand (cf. the Production Leap).

4.2 CENTRIM

Summary

The predecessor to CENTRIM started in 1987, and in 1990 the centre was re-branded as CENTRIM (Centre for Research in Innovation Management). CENTRIM has a strong focus on developing business tools, products, training, workshops, and consultancy services and offering them to industry. The target groups are both companies and consultants. CENTRIM's philosophy holds that it is possible to develop all kinds of companies through powerful and systematic intervention, including large multi-nationals, as well as small and micro enterprises, in deprived UK regions or in developing countries. CENTRIM offers six different audits focusing on different aspects of innovation, such as awareness, readiness, and capabilities. They also offer audits through which a company can adjust its competitive strategy or become more agile. CENTRIM's consultancy services are supported by these highly standardised 'audits' or assessments. In addition, external consultants are trained and certified and thus can use CENTRIM's analytical tools. Consultants that have been accredited by CENTRIM, however, may lose their accreditation if they do not regularly use the tools. CENTRIM's funding comes from consultancy services, licensing fees, and govern-mental funding.

Profitnet is another product, which is available in different variants. Profitnet is a structured and facilitated process for peer-to-peer learning between members of a learning network for SMEs. It is organised as three hour monthly group meetings supported by an experienced and trained facilitator. Profitnet members can also be part of an active online community. An IT platform is therefore also part of CENTRIM's offerings. Data has indicated that Profitnet has impact both on innovation processes and in the organisation and on launch of new products and services. The impact has been primarily on problem-finding and problem-solving skills, new innovation strategies, and management capabilities. It has also been reported that Profitnet had an impact on the bottom line.

CENTRIM started in regions in the UK but now has international coverage, with tools diffused to Ireland, Brazil, and South Africa. Lessons learned concerning Profitnet included the fact that securing a critical mass of participants was crucial and demanded a deliberate strategy; that the role of network promoter was important to help setting up ground rules that contributed to establishing trust among the participants necessary for sharing company information. Finally, it was found that the co-ordination of learning networks at times needed a neutral external intermediary and that networks that continue over a longer period of time risk getting stale, which is why it is important to have a 'membership refreshment' policy. The initial public investment during the development phase was around £ 4,790 per company but since 2009, during on-going operations, the public investment is £ 891 per company for 18-month standard Profitnet and £ 1,566 for 18-month Profitnet Plus, the add-on version focused on innovation.

Background and purpose

CENTRIM started in 1987 at the University of Brighton under the name 'Centre for Business Research' and changed its name in 1990 to CENTRIM – 'Centre for Research in Innovation Management'. CENTRIM has a strong focus on developing business tools, products, training and consultancy services, and offers them to industry. CENTRIM offers tried-and-tested resources that help organisations to create new value though innovation. In addition, CENTRIM aims at diffusing its products/services to a broader group of consultants that are trained and can be certified by CENTRIM to use their products. The Profitnet 'learning network' has been one major activity for CENTRIM since 2004.

Uniqueness

CENTRIM has found ways of scaling its offerings both through the learning networks, where other participating companies provide essential input for participants' development, and through training and certifying consultants to use CENTRIM developed products. The Profitnet programme uses the unique mechanism of peer-to-peer learning (in learning networks), which has been of value for development of SMEs, including some special groups of SMEs such as companies run by female entrepreneurs, start-ups, micro- and small, creative industry, and social enterprises. Profitnet has also successfully introduced the concept of innovation and the Innovation Management process to mainstream SMEs that initially viewed Innovation Management as something only for businesses with advanced technology or for large enterprises.

Identified results

CENTRIM started in 1987, is still active after 25 years. In the UK, the Profitnet 'learning network' started with a pilot including 76 SMEs in 2004-2005 and continued with a second phase in 2007-2008 involving 364 firms in 32 networks, a third phase in 2008-2010 involving 109 firms in ten networks, and a fourth phase in 2010-2011 involving 109 firms in nine learning networks. In total, more than 1,000 small companies have participated in Profitnet's process in three different countries, UK, Ireland, and South Africa.

It is difficult to estimate the impact of all the services CENTRIM provides, as well as the quantity and quality of what they do. However, the Profitnet learning networks have been carefully evaluated. Reviewing the evaluations of the programme, it is clear that Profitnet has developed in an impressive manner when comparing the results from 2006-2008 (Tsekouras et al., 2009) with the more recent ones from 2008-2010 (Kanellou et al., 2011) and 2010-2011 (Tsekouras et al., 2013). There is evidence that the third phase of Profitnet (six groups of 'standard' Profitnet and four groups of Profitnet Plus) had a considerable impact. The financial results (profit, turnover, employment) increased significantly against the background of the economic crisis. In addition, Profitnet was also evaluated in comparison to a control group of similar companies outside the programme and it was found that hard data (employment, turnover, and profit) indicated that the companies participating were below average at the start of the programme and above average after one year.

In terms of innovation, the participants also demonstrated a considerable improvement. Over the life of the programme there was an increase in new products (94%) and new services (88%), and spin-off business start-ups (43%) and the firms also reported improvements to internal operations. Nearly half reported business advice exchange across the network, 21% had entered into formal joint ventures with other group members, and 42% had formally collaborated with a university.

An interesting finding from the evaluation is that a large percentage of Profitnet Plus members (60%) participating in a follow-up programme (they have already gone through a 'standard' Profitnet cycle) requested more mentoring from other Profitnet members. This indicates that these members, who have experienced learning from other companies in a learning network, also want to increase this form of learning. Quotes from this group included "*Learn by helping others*" and "*to review my business from a fresh perspective and receive valued input from other business people*" and *"to share challenges with other members and to help me develop a new product in a market I am not familiar with"* (Kanellou et al. 2011).

An additional goal of the programme concerned the improvement of the relationship between SMEs and academia. Kanellou et al. (2011), concluded that in the Profitnet programme "*the academic team … had the unique opportunity to advance their understanding of the challenges and the potential of small businesses – as reflected in a number of academic papers and research grants gained as a result of the programme*' and the Profitnet programme "*…enabled the University to contribute critically to the development of 'mainstream' small enterprises and connect them with the innovation mindset and techniques*."

Also interesting to consider is the multiplier effect of training consultants in further effecting a diffusion of CENTRIM-developed tools and work approaches. Through the accreditation process, CENTRIM keeps a quality control on consultants.

Object and theoretical background

Object

CENTRIM offers a range of services including the following:

- 'Consultancy' – case-by-case consultancy aimed at identifying what is hindering innovation and developing companies' innovation capabilities
- 'Diagnostic audits'
- 'Knowledge Transfer Partnerships' – basically facilitating internships for graduates
- 'Training and educational programmes' – from a couple of hours to a couple of days – typically aimed at company managers
- CENTRIM services also include: 'Workshops' – for companies with the goal to create new ideas for product development, innovation strategies; 'Lead Users Analysis'; and 'Learning networks'.

CENTRIM also trains consultants to be able to use the tools they have developed on a broader scale. Consultants can become accredited but they lose their accreditation if they don't use the tools at least twice a year.

CENTRIM offers six different types of audits focusing on different aspects of innovation awareness, readiness and capabilities. The audits can be performed either by the company itself or with the assistance of a CENTRIM consultant. The innovation capability audit is a 54-item questionnaire, which, if performed by the company itself costs £1,000 (audit tool, explanatory material, and one company license) or, alternatively, £6,000 if using the support of a CENTRIM consultant. This audit assesses the extent to which an organisation possesses the distinctive capabilities to be innovative in comparison to a research-based model of best practice. The organisation gets access to a database of other organisations' scores on the 54 items. The objective is to provide a common language and identify strengths and weaknesses in innovation capability in order to establish goals for an innovation-oriented organisation development programme. The readiness to innovate assessment is a structured assessment process to enable managers to evaluate whether their organisation is ready to undertake a specific and usually large innovation initiative and to determine what essential capabilities are weak or missing. The assessment is research based but specific to a particular innovation initiative and the objective is to identify the requirement to successfully implement an innovation initiative and answer the question "*can we do this?*" and if not, "*what weak or missing capabilities do we need to develop?*" If done by CENTRIM, the price is £3,500. If conducted by an in-house company assessor, the cost is £1,500 for the assessment process, explanatory materials, telephone support, and a single-company license. The innovation for competitive advantage audit is a strategic level questionnaire and data-feedback process. The approach is based on a Harvard Business School 'uniqueness drivers' framework and purports to identify whether an organisation is innovating in areas that are required in order to deliver a distinctive competitive strategy. This assessment is directed to the organisation's top team, and the objective is to relate innovation to competitive strategy and focus resources for innovation in areas that strengthen the strategic differentiation. For a company, obtaining a single-company license, materials, and telephone support, costs £2,000, whereas if CENTRIM performs the assessment, the cost will range from £5,500 to £8,500 depending on whether or not the company has developed a competitive strategy.

The agility audit is another organisational survey with a 48-item questionnaire based on CENTRIM's own research on agility. It estimates to what extent an organisation is agile – that is, is quick to respond to changing circumstances. The instrument is built around four dimensions: agile strategy; agile processes; agile linkages; and agile people. There are two variants of this questionnaire, one for larger organisations and one for SMEs. The objective is to identify current strengths and weaknesses in the deployment of agile characteristics and to establish goals for an agility-oriented organisation development plan. A single-company starter pack is £1,500, and each additional time the questionnaire is used it costs £250. Finally, CENTRIM offers two innovation skills surveys based on a self-assessment approach. One 49-item survey is focused on individual behaviour and is distributed to managers and other employees who are leading innovation initiatives. This survey is used primarily for peer-to-peer coaching. It enables individuals to become clearer in their role of leading innovation initiatives and to develop goals to improve personal innovation skills. The cost is £1,100 for materials

and a one-year license, which can be renewed annually (cost £300). The second skills survey assesses the ability of change leaders to implement innovation initiatives. This self-assessment is based on a 40-item questionnaire that covers four competence areas: motivation, personal traits, self-image, and skills. Based on the self-assessment, the participants select three items they feel would be helpful to work on during the next few months. In addition, it is possible to add others' feedback. The change leaders' assessment audit is sold in packs of 10 (£1,000).

Profitnet (Profit through Networks) is an example of a learning network for SMEs (mainly small, with fewer than 10 employees, and a few medium-sized, up to 250 employees). It is a 12-18 month programme for company managers (and often owners), made up of three hour monthly group meetings supported by an active online community. The Profitnet groups are led by facilitators and exchange innovative and creative business solutions ranging from product development, marketing, and financial planning to recruitment and staff retention. Profitnet enables small- and medium-sized enterprises to learn from one another and gain access to the expertise of a university or business support partner as well as receiving input from practitioners from other businesses. Business owners, directors and senior managers work together, in a confidential environment in a peer-to-peer structured sharing process – one participant presents his/her business strategy for the other participants, and together they try to find solutions to real business problems and help each other to seek new opportunities. A key issue concerns how to develop trust among participating companies; external neutral facilitation has proved essential, as has setting up 'ground rules'. At each meeting the participants have to say what to do over the next month in order to progress, and at the next month's meeting they have to tell what they actually did and others interrogate them. It is a highly structured, facilitated, and managed programme. The initiation of the Profitnet programme followed a certain standardised structure: (1) several rounds of introductory discussions with local development agencies, (2) four focus groups with 20 local firms providing a taste of the programme activities, and (3) a major launch. The two first steps are designed to convince managers of local development agencies and to create local ambassadors in the industry community.

For the companies that have taken the basic programme there is an add-on programme called 'Profitnet Plus', which focuses on innovation. In an introductory workshop 'innovation' is introduced as ''*the implementation of any new idea which adds significant value to the business and/or the customer*". Each participating company lists the ten key areas they want to improve, and the programme provides experts who lecture and can be hired for innovation counselling. This workshop also introduces the Innovation Diagnostic, where the members provide the information and consultants produce a report, which serves as the basis for developing individual Action Plans for each member company. Each member presents the Action Plan for his/her group and receives feedback and support; then when they move forward with their innovation project, they can use the group meetings to gain support for challenges, problem solving, and new ideas. Hence, Profitnet Plus combines the peer-to-peer interrogation/learning with support for capability development. According to the evaluation

(Kanellou et al. 2011), the members gained the most value during the implementation phase, when they had to undertake real actions and execute changes in their organisation.

Another variant of an add-on was the Profitnet Buddy pilot programme that was built on the idea of increasing the feedback between member companies by arranging the members as mentors and mentees meeting twice a month. Except for the mentor programme, the design was similar to the Profitnet Plus with member feedback meetings and a diagnostic analysed by a consultant, resulting in an Action Plan. A large majority of the participants valued this opportunity to give and receive feedback from other businesspersons, although the matching process seems crucial, and in most cases it seemed to work well.

Another programme is Develop Innovation Skillset, directed towards senior management. It is given in a three-day workshop format with facilitation before and after. CENTRIM certifies instructors to run these workshops in the UK and other countries.

Theoretical background

CENTRIM's focus is the management of innovation. On its home page, it comments that this is not easy, that there are risks involved and that it is easy to waste resources. However, CENTRIM also points out that innovation capability enables organisations to exploit opportunities and create value from new ideas, and that research has shown that, on average, innovative businesses are twice as profitable as non-innovative companies. Innovation drives progress for social and environmental benefits, and the capability to manage innovation successfully is one of the key success factors in 21st-century business.

The characteristics of CENTRIM's products and services are that they (1) have a solid foundation based on extensive research, (2) are developed through many years of close engagement with businesses, and (3) are intended to develop innovation capability, thereby advancing the practice of Innovation Management internationally.

Hence, CENTRIM's research mission is "*to consistently develop new knowledge and understanding of how innovation works in practice*". And CENTRIM's goal is 'to work with its partners in industry, government and other organisations to provide exciting new insights into innovation dynamics — and to help improve the innovation performance of organisations.' They accomplish this by not only developing new concepts and theories to explain innovation, but also by generating the data needed to test the new theories.

Target group(s) and underlying philosophy

Target group

CENTRIM services are targeted both towards companies and towards consultants, providing a scaling effect. As part of University of Brighton, they receive a great deal of their funding from the government, and some income through their consultancy services.

Part of CENTRIM's target group is outside of the UK – for example, in Latin American and Africa. The idea is that the same approach to developing local consultants works in other parts of the world as well.

Underlying philosophy

CENTRIM's research philosophy is inspired by the 'engaged scholarship' approach, developing modes for co-production of knowledge and in collaboration with firms and other organisations. CENTRIM has consistently followed this approach in its research when working with large multinationals, small enterprises, deprived UK regions, or developing countries. The underlying philosophy is that it is possible to develop all kinds of companies through powerful and systematic intervention with "*extremely powerful results"* for the research.

CENTRIM's approach is to structure learning processes where the target group itself provides part of the input to other participant companies' development – through learning networks.

Geographical scope and set-up

Geographical scope

CENTRIM started in regions in the UK but has an international coverage today and has diffused its tools to Ireland, Brazil, South Africa, and other countries.

Set-up of programme

The Profitnet programme was developed through a number of government-funded projects. First, between 1997 and 2000, an EPSRC-funded programme researched the phenomenon of 'learning networks' (around £330,000). Between 2000 and 2004, there were another two EU research projects. The pilot phase of the Profitnet (2004-2005) was a grant of £175,000 (EU Structural Funds) through South East Government Agency (local government) to help Hastings in the UK. Between 2006 and 2008, CENTRIM received a huge grant (£2 million) from HEFCE (Higher Education Funding Council for England) to validate the model with several groups and several small businesses in the region. At this point, the development phase was over. From this point on, CENTRIM started charging the participating member companies.

Currently members are charged a basic subscription (£33 per month for Profitnet and £58 per month for Profitnet Plus), which does not cover the full cost. A very rough estimation shows that it covers approximately 40% of the total cost. The remaining cost is covered by government grants like HIF (Higher Education Innovation Funds).

To be a facilitator in the Profitnet Plus, consultants are trained by CENTRIM in the diagnostic process, and CENTRIM provides support throughout their engagement, for example, if they have burning problems to discuss. CENTRIM has developed a diagnostic tool that has a great many visual graphs and figures, and it automatically produces a report for the Profitnet Plus member. Also project managers are trained by CENTRIM. Both project managers and facilitators need to be mature people with some significant work experience, preferably in the facilitation area.

Metrics

The metrics used in evaluations of the Profitnet programmes are a combination of hard data (number of employees, revenue, profit) and a comparison of companies inside with similar companies outside the programme. These offer an opportunity to assess the general impact of the programme.

The hard data evaluation is supplemented by soft perceptual data from the companies collected through a self-evaluation of the impact of the programme on each company. In addition, Profitnet collected observational data as part of an action research approach, including academic ambitions. One of the goals of the Profitnet programmes was to increase the links to academic institutions and, hence, one of the measurements was the range and number of relationships with local universities and service providers.

Effects

Data from 2006 and 2007 had indicated already that Profitnet had a considerable impact both on innovation in processes and in the organisation and on the launch of new products and services. The respondents indicated an impact in terms of problem finding and solving skills, new innovation strategies and management/leadership capabilities. These areas of improvement were further reinforced according to the evaluation of the 2008–2009 phase of the programme. However, an improvement in terms of 'managing relationships with other organisations' had an impact on businesses, and this improvement could be an effect of the programme design that included learning networks. In the add-on programme Profitnet Plus, 75% of the participants indicated a direct impact on the bottom-line of 'accessing and using external knowledge' (for standard Profitnet it was 69%). Concerning 'development of new products, processes', 80% of Profitnet Plus reported an impact on the bottom line, and this number is supported by a 25% profit increase during the recession period in 2008-09 for the Profitnet Plus participants (Kanellou et al, 2011). In the evaluation of the 2010-2011 standard Profitnet programme, the participants were very satisfied (50%), satisfied (27%) or neutral (11%) regarding the programme. The participants perceived that their innovation capabilities and skills had been enhanced significantly, particularly their ability to 'scan the environment for new ideas, market trends' (67%); 'to access and use external know-how' (67%); to develop 'leadership and organisational change'; (63%) and to 'develop new products, services or processes' (63%). This means that the two-thirds of the participants perceived that their participation in the standard Profitnet learning network had a significant impact on their innovation capabilities and skills. Another interesting metric concerns their satisfaction with the peer-to-peer action learning sessions. Here, 95% found the process of sharing challenges in their organisations very valuable or valuable, and 92% found the solutions to those challenges identified by other members useful or very useful (Tsekouras et al., 2013).

The effectiveness of the programme in terms of results in relation to input from public sources is hard to calculate, but a crude estimate starting with the pilot programme and ending when the programme development phase was considered to end in 2010 shows that the average public investment was slightly above £ 4790 per company. Since then,

each member is charged £33 per month, which means that the public investment for an 18-month learning network is only £891 for the standard Profitnet and £ 1,566 for the Profitnet Plus, which focuses on innovation.

Lessons learned

The Profitnet programmes have been evaluated regularly as part of a research process, and lessons learned from Profitnet also have been the subject of academic articles (e.g., Bessant et al., 2012).

Bessant et al. (2012) comment that based on their literature studies and empirical studies, including Profitnet, learning networks have the potential to enable acceleration of innovation – but that the data also suggests that building and operating such networks effectively is a complex process. Above all issues around building and sustaining trust within networks, shaping a learning agenda, convening and co-ordinating without imposing are issues that need consideration.

The motivation to participate emerged in a number of forms and was often a combination of threats and incentives. In the Profitnet pilot programme, the motivation was the need to upgrade the economic conditions in an area with high unemployment. Later Profitnet networks were motivated by needs that included accelerating economic growth and developing service-support relations with higher education. Securing a critical mass of participants is a key issue, and Profitnet's way of securing a sufficient number of allies and participating companies was based on a deliberate strategy. It included meetings with authorities in contact with SMEs, focus groups to establish relationships with firms, and a major launch event. The role of network promoters was important – in the case of Profitnet it was "*a group of trained facilitators who provided catalytic support to each network, helping shape the initial set-up and elaboration of operating ground-rules as well as enabling connectivity to other relevant learning resources over the life of the project*"(Bessant et al., 2012 p. 1101). Establishing trust within the network turned out to be a key issue, starting with establishing 'commitment trust' during the initial formation. 'Competence trust' emerges as members provide competent feedback and interact around 'worthwhile' ideas, and through this close interaction a 'companion trust' can evolve based on strong personal relationships. However, there are barriers, such as members withholding information, or members acknowledging problem issues but putting the blame only on external factors beyond their control. Information and knowledge management are important operational areas for learning networks. There is a risk of insularity where members group-think, but in the Profitnet programmes this risk was balanced by input from external sources such as from university people, around, for example, 'new product development'. Because most firms in Profitnet were small, there was also a need for brokerage to actors with complementary capabilities, including with local universities and service providers. Another lesson from Profitnet concerned the need to maintain the motivation to participate in the programme. A central motivation was the development of an awareness of other benefits. One example mentioned was 'group support for taking risky action' through peer-to-peer elaboration, and another benefit participants highly

appreciated was ‘learning from innovation failures’. For the co-ordination of learning networks, it was found that a neutral external intermediary could be an important facilitator in overcoming internal conflicts and mistrust – but this intermediary could also function as a neutral broker, mediating cooperation and drawing together disparate interests. Profitnet had facilitated mechanisms to protect confidentiality and to secure against information leakages in order to create a confidential and risk-free environment where members could expose their weaknesses and share confidential information among the participants. Finally, there is the question of whether to sustain or close a network. In the Profitnet case, the networks were run as projects with a specified time frame of 12–18 months. In several cases the companies wanted to continue, however, sometimes in the regular Profitnet-standard, and sometimes in the add-on version Profitnet-plus and buddies. One lesson is that networks that continue over a longer period of time risk getting ‘stale’, and hence, it was found that there is a need for a ‘membership refreshment’ policy to deal with this challenge—either providing new external challenges or input or providing new information and learning areas.

Although the experiences from the Profitnet programme have contributed to our understanding of the role of ‘learning networks’, Bessant et al. (2012) comment that some key issues, including trust building and network operating processes, have a marked influence on the successful operation of such networks, and they argue for further research around such issues. They argue especially for “*better models for setting up learning networks and the development of key skills – around brokerage, facilitation and benchmarking – to accelerate learning*”.

According to Profitnet, experienced programme managers and facilitators are the key to success. Having university students facilitating would be a big mistake – in fact, it would be unfair to ask somebody without sufficient life experience to facilitate experienced businessmen and -women who (may) test your limits all the time.

There are four ways to keep the quality standards in the Profitnet programme: (1) a training programme and accreditation for project managers (two full days) and a full operational manual with guidelines and tips for the job and pre-developed tools and templates to use during the learning network; (2) a training programme and accreditation for facilitators (two-to-three full days), including a full operational manual with guidelines and tips for the job and pre-developed tools and templates to use during the learning network; (3) coaching facilitators, including giving them refresher workshops during the duration of the programme along with on-the-job mentoring, for example, an experienced and good facilitator observing their sessions and giving feedback and telephone support; (4) filling the master matrix by keeping records of participation in the running groups and spotting any consistent dips in the participation of members or erratic participation for long periods; and, finally, (5) an evaluation of results at the end of the programme with results compared to benchmarks. In Sussex, the Profitnet Programme Managers attend the groups and are in touch with members continually to spot emerging problems or critical issues.

Next step

Not disclosed.

Researchers' reflections

This programme is driven by the dual missions of simultaneously impact organisations and creating new knowledge according to an action research approach. The way of working seems to be adjusted according to client-firms, which means that all kinds of firms are targets, including micro firms and mainstream SMEs that view themselves as very far away from any kind of Innovation Management. In fact, this programme's more sophisticated segmentation of end-client groups is interesting and might indicate that the 'object' needs to be adjusted to specific segments' needs and that segments must be on a more sophisticated level than SMEs or growth-oriented SMEs. CENTRIM's demands on facilitator experience and training are very high, and the learning network process is highly structured and managed. Nevertheless, it seems as if CENTRIM is able to train consultants to become qualified facilitators using CENTRIM-developed approaches and tools. It would be of interest to analyse in more detail this process of training and accreditation of consultants that is the basis for scaling and reaching more end-clients than CENTRIM itself could manage to reach.

4.3 The Innovation Engineering System

Summary

Different factors triggered the start of the movement around Innovation Engineering. First, the founder of Eureka!Ranch was influenced by Dr. Deming's work and applied his principles at Procter & Gamble and later at a number of multinational corporations. Second, there was dissatisfaction among universities and experts such as the Kauffman Foundation regarding current entrepreneurship programmes. The result was the establishment of the Innovation Engineering Institute (IEI), a partnership between the university (University of Maine) and the private sector (Eureka!Ranch). In 2005 the first classes were taught at University of Maine, and over the next seven years, the subject was approved as a minor and then as a graduate certificate there. Seven other universities and colleges licensed the programme. In 2010, IEI launched a leadership institute, which was attended by, among others, NIST/MEP, which currently has some 1,300 advisors to small- and medium-sized manufacturers. NIST/MEP decided to co-sponsor the leadership institute and there is now a three-party co-operation towards the manufacturing sector among the private sector, the university, and the government, which according to the founder of Eureka!Ranch is the most optimal solution.

The purpose of the Innovation Engineering System is to help organisations to reignite a culture of innovation. This process is achieved through education, a systematic solution, and in the end a change of the mindset of the leaders. The 'object' consists of two parts, education and training and an online platform; the platform consists of innovation-engineeringlabs.com and innovationsupplychain.com. The latter allows open innovation to a certain degree. Generally, the object and the system for Innovation Engineering are tailored to different target segments and to local cultures and set-ups. For example, the

regional or local solution within different states in the Unites States depends on issues such as funding, skills, capacity, and politics. The target groups are either individuals or organisations: first, individuals working in academia, SMEs, large corporations or government that want to, or are financed to be, internal change agents; and second, universities/colleges, SMEs, large corporations or governmental entities that are interested in licensing the Innovation Engineering System approach in order to diffuse it further to end-clients. For this reason, four different licensing agreements have been developed, of which three are re-seller agreements.

The programme is therefore built to be scalable and to re-use existing local infrastructure. By co-operating with NEST/MEP, the scalability of the programme seems quite high; in 18 months, 3,000 companies (167 per month) have applied parts of the Innovation Engineering System and 300 MEP advisors have been or are in training. The hub of the programme is IEI, which develops, packages, and files patents for the products and services and acts as a single certification body of change agents.

Metrics are primarily kept on the innovation system, such as the number of innovations and the value of innovations in the pipeline, and on the engagement level, such as the number of trained employees. There is also a firm culture index score that indicates the firm's innovative climate but not firm level metrics on, for example, revenues or profit.

However, even if the programme seems to have been quite successful, one lesson learned is that it is very hard to sell Innovation Management and that it is specifically hard when the company is older and/or on the downward side of the life cycle. Therefore, the education of leaders within companies is important as an early step, as is showing quite rapid results by transforming the company step-wise, in waves, engaging first early adopters working on specific areas in short projects (three months) and showing results. The packaging of methods and tools were perceived as important because it gave the receivers something to hold on to. In addition, both communication and solutions need to be simplified in order for both consultants and clients to understand. Finally, the programme co-ordinator emphasised frequently the importance of testing and learning and pointed out that the programme has been continuously developed due to a long journey of learning.

Background and purpose

The programme could be viewed as a movement built around the Innovation Engineering (IE) system. The founders describe it this way:

> *"Our vision is to transform innovation from a random event into a reliable system, a scientific system, for profitable growth - to do to innovation what Dr. Deming and others did to quality. Our goal is to transform the cultures within companies, colleges and countries into cultures of never ending innovation and growth. We do this by educating and enabling innovation Change agents with the mindset, skills and tools needed to increase innovation speed (up to 6X) and decrease risk (30-80%). The Innovation*

Change agents include company and government leadership, as well as current and future employees (college students).”

The Innovation Engineering System approach is only three years old but is the result of several years’ learning process.

The original idea for the Innovation Engineering System approach was sparked when Doug Hall, the founder of Eureka!Ranch (a key stakeholder in the programme), learned about Dr. Deming’s work at Nashua Corporation in the early 1980s and applied Deming’s systems approach to innovation at Procter & Gamble. After ten years, Mr. Hall retired from Procter & Gamble and founded Eureka!Ranch. Eureka!Ranch’s primary business was and remains focussed on helping thought-leading multi-national companies to increase innovation speed and decrease risk. Because of a personal interest in SMEs, Eureka!Ranch ran their first small business innovation programme in 2002. It was licensed to providers in the United States, Canada, and Scotland and within a few years worked with more than 300 companies.

Triggered by universities and independent experts such as the Kauffman Foundation, whose dissatisfaction with current entrepreneurship programmes (small enrolments and lacking the impact that the stakeholders had hoped for), Eureka!Ranch together with University of Maine later founded the Innovation Engineering Institute and a programme that was supposed to be a career accelerator for all students, no matter what degree, career, or passion they had. The idea was that if a student took Innovation Engineering as a minor or as a graduate certificate, he or she and thereafter would be better able to commercialise unique ideas. The programme/discipline was to report directly to the provost in the state and was not to be a separate department. In 2005, the first classes in Innovation Engineering were taught at the University of Maine. In 2009, Innovation Engineering was approved as a minor at the university, and in 2012 the graduate certificate was approved at the university. In parallel, seven other colleges and universities licensed the Innovation Engineering programme and started teaching classes.

In 2007 a version of the IE approach, called the Eureka!Winning Ways was introduced to the NIST/MEP network. In 2010, the NIST/MEP leadership attended Eureka!Ranch’s Leadership institutes and became interested in the programme. In the early summer that year, NIST/MEP centres started co-sponsoring IE Leadership Institutes. NIST/MEP centres involve some 1,300 MEP advisors who focus mainly on manufacturing SMEs. Over the years, more than 1,500 projects have been completed by MEP centres using various versions of the approach.

In 2009, the infrastructure in the form of a digital hub was launched. The digital hub comprises two parts: Innovation Engineering Labs.com (exchange experience and learning between trained change agents, so-called Black Belts) and Innovation Supply Chain.com (enables change agents to find and filter external technologies that can drive profitable growth).

The purpose of Innovation Engineering System is to help organisations reignite a culture of innovation within their organisations by transforming the mindset of both the leadership and the workforce. Specifically, the system is focused on helping increase innovation speed and decrease innovation risk. This is accomplished by a total system of innovation with a specific mindset and by educating and enabling innovation change agents (leaders and managers) in the innovation system in order to increase innovation speed and decrease risk.

Uniqueness

The Innovation Engineering System approach is differentiated by its focus on the total system in an organisation and on data gathered during live projects and subjected to statistical analysis. It is also differentiated as a 'movement' or as a 'save the country programme', where the ultimate goal is to transform the mindset in organisations from a cost-control culture to an innovation culture.

Identified results

The primary official metric used when presenting the result of the movement is the total value of projects currently in the innovation pipeline. The total value communicated is currently $4.1 billion. This figure, according to the Innovation Engineering Institute's own report, represents some 26,000 quantified innovations and 70,000 jobs based on a model developed by the Center for Regional Economic Competitiveness from the US MEA, US Economic Census and Economic Modelling Specialists, Inc.

In addition, more than 1,500 companies have been educated in all or have been part of the Innovation Engineering System approach, and more than 15,000 managers have been involved. In addition, approximately 350 people are in the process of being certified as Black Belts (change agents) and more than 400 courses are given every year. The development of the Cycles to Mastery approach is expected to allow training of an even higher number of Black Belts. The 350 Black Belts, the core community of the Innovation Engineering System, have helped each other more than 10, 000 times a year through the Innovation Engineering Labs request platform and Black Belt blog. Collectively, the Innovation Engineering Labs.com Website gets 70,000 page views a month by Black Belts and innovation project teams. Further, the number of innovation request responses from the innovation marketplace (innovationsupplychain.com) was 9,600 per year. The total value of translated technologies in the Innovation Marketplace was $954 billion. Finally, the improvement in development success rate has been identified to be 250%.

Object and theoretical background

The 'object' has developed over time and has been tailored towards different target groups (see www.innovationengineering.org). The first version of the object offering was tailored towards multinational corporations. The second version was tailored towards the University of Maine. The first class in Innovation Engineering started in 2005 and was then peer reviewed and improved.

Around 2009 the infrastructure was launched as part of the IE approach. Here the Innovation Engineering Black Belts can access tools, a project management system, an idea sharing system, and different communities. The innovation engineering lab portal provides common metrics and control charts. The labs platform gives transparency and metrics and a road map for company teams where the consultant can guide their process. The innovation engineering labs portal also provides a global community of Black Belts and a meeting place where they can share best practices and learning. There is also a blog for Black Belts sent out every morning.

In 2010, the Innovation Engineering Leadership Institute that focussed on companies was started. In the same year the US department of Commerce (NIST/MEP, the National Institute of Standards and Technology's Manufacturing Extension Partnership, a $300-million-dollar public-private partnership) became involved with the Innovation Engineering Institute. As a result, the programme now had to offer both scalable training of the MEP advisors and training of internal employees at companies and non-profit organisations. The time it takes to train change agents or Black Belts, has been average of 18 months but is now targeted to go down to three-to-six months through an approach called Mastery of Cycles, which is built on findings from Bloom (1984).

Currently, Innovation Engineering System's object consists of two main parts, education and online infrastructure in order to enable change agents. The Innovation Engineering body of knowledge is taught in four formats: an Innovation Engineering undergraduate minor, a graduate school certificate, a community college certificate / associate's degree, and executive education of Black Belts (intensive innovation college plus project coaching). The educational programmes are aligned and continuously improved simultaneously. The Innovation Engineering Institute handles all certifications of teachers and Black Belts, which is in contrast to the '6 Sigma' certification, where there is no common standard or singular accreditation body. Innovation Engineering is based on a body of knowledge that contains 48 skills. The 48 core skills are divided into 12 sub-skills in each of four main phases: Create, Communicate, Commercialise, and Accelerate. Further, according to Innovation Engineering Institute, it is a multi-disciplinary field blending the humanities, engineering, business, and patent law. The infrastructure provides two platforms, Innovation Engineering Labs.com and Innovation Supply Chain.com. The first platform enables change agents to increase speed and decrease risk with their innovation projects. It includes systems such as a project acceleration system, access to an active community of change agents for support, and a wisdom mining system. The wisdom mining system includes a simultaneous search of nine databases to find academic knowledge, unique patent buying opportunities, patent trends, and the like. The second platform, the Innovation Supply Chain.com platform, enables change agents to find and filter technologies that can drive profitable growth. This platform is a marketplace (USA National Innovation Marketplace) of technologies that have been translated so that their business potential can be understood easily. It also includes a closed Innovation Request platform, where change agents can post innovation requests to the entire Innovation Engineering community for help with ideas and advice and to help them find technologies, experts

and manufacturing capabilities. The Innovation Supply Chain.com platform therefore allows open innovation to a certain degree.

Innovation Engineering System's current offerings in form of education and infrastructure are packaged a little bit differently depending on targeted customer segment. Currently there are three main offerings: college, university, and k-12 academic programmes (including an undergraduate minor, graduate school certificate, community college certificate or associate's degree, innovation summer camp, after-school innovation club, hands-on innovation engineering workshop, and infrastructure); small and mid-sized enterprise company offerings (including education in engaging the enterprises, the IE management system, IE workshops, and idea accelerator projects and infrastructure); and large company, college & government department offerings (including: education in the form of an IE retreat, IE accelerator, and IE culture change programme and infrastructure).

Innovation Engineering is viewed as a solution that complements, rather than substitutes for, a firm's already established product development process. For example, of the four different project stages (Define, Discovery, Develop, Delivery) in the Innovation Engineering approach, Define and Discovery could complement, while the two last stages could be part of a company's normal development process (e.g., a Stage-Gate® model). There are two reasons why the first two stages are especially valuable: first, the beginning of the innovation Engineering process forces the company to re-evaluate its strategically most important issues for long-term competitiveness, a process used to prioritise ideas in the two first stages; second, the methodology requires the idea to be well defined in the very beginning, which increases its success rate later in the development process.

The strategic intent of the Innovation Engineering Institute is to keep the core staff small and focus on innovation of the overall system. Expansion is therefore done through licensing to existing organisations to deploy the educational and infrastructure systems developed by the Innovation Engineering Institute team. There are four types of Innovation Engineering licensing agreements (each agreement includes a customised blend of Education and Infrastructure). The licensing agreements are: the Innovation Engineering Black Belt SITE license (enables companies, colleges and government agencies to use IE internally); the Innovation Engineering SME Black Belt license (a commercial reseller agreement that enables government programmes, non-profits and for-profit organisations to market IE SME services to companies with a maximum of 250 employees); the Innovation Engineering Enterprise Black Belt license (a commercial reseller agreement that enables government programmes, non-profit and for profit organisations to market IE Enterprise services to large organisations); and an Innovation Engineering Academic Black Belt license (a reseller agreement that enables accredited, non-profit education institutions to offer IE courses and to offer commercial services to SME companies under 250 employees).

Theoretical background

Deming's principles and processes inspired the design of the Innovation Engineering System. The approach is also influenced by people/organisations like Dr. VanGundy, Hermann International, Tony Buzan, AC Nielsen BASES, and DeBono. Later the Cycles of Mastery approach has been heavily influenced by Benjamin Bloom's publication on the '2 Sigma Problem' in 1984: 'The Search for Methods of Group Instructions as Effective as One-to-One Tutoring'.

Target group(s) and underlying philosophy

Target group

Eureka!Ranch, founded by Doug Hall, focuses primarily on helping thought-leading multinational companies such as Nike, Walt Disney, Pepsi, HP, and American Express increase innovation speed and decrease risk. These companies remain clients today. Instead of the Eureka!Ranch inventing ideas for the companies, however, it helps them create a culture of never-ending innovation with increased speed and decreased risk.

Individuals who invest in becoming change agents, certified as Black Belts, are the primary target group for the Innovation Engineering Institute. This community of Black Belts becomes the main driver behind the improvement of the body of knowledge in Innovation Engineering. These people act as the thought leaders that guide the movement. The Innovation Engineering Black Belt change agents exist within companies, colleges, governmental agencies, and non-profit organisations. These organisations can be viewed as an additional target group if they are interested in licensing the Innovation Engineering approach in order to diffuse it further to other end-clients as resellers.

Underlying philosophy

The strategic intent of the Innovation Engineering Institute is to keep the core staff small and focus on innovation of the overall system. Their primary role is therefore not to deliver the solutions themselves but to train others to be able and have the confidence to help companies and organisations in need of increased innovativeness. The philosophy is to re-use local networks of actors already established in, for example, a region, by educating and training them and providing them with support through the online infrastructure system. The exact constellation of partners in each region depends on the region's set-up, presence of governmental programmes, and so forth.

Geographical scope and set-up

Geographical scope

The programme is primarily a U.S.-based programme. However, a small and mid-size corporate programme was launched in Scotland in 2002 and has since been licensed to providers in Scotland and Canada. Today, the programme has sporadically diffused to South Korea and Ireland, and as a result, a director for Europe has been appointed. The European director takes the concepts developed in the United States internationally together with the concepts of different local partners in Europe. The idea is the same as in the United States, to provide existing networks of consultants and advisors with the Innovation Engineering concepts, rather than to perform their own consulting. The European director is investing approximately 40% of his time on selling/promoting the

programme, 40% on developing others' capacity to sell and deliver, and 20% on delivering or working with partners to deliver.

Set-up of programme

Currently, the programme includes stakeholders such as the Innovation Engineering Institute, the government in the form of NIST/MEP, state and local government groups, universities and colleges, larger corporations, and non-profit organisations such as, for example, chambers of commerce, the National Wildlife Foundation, and the College Board. The hub of the programme is the Innovation Engineering Institute, which is a joint venture between the University of Maine and Eureka!Ranch. The Innovation Engineering Institute develops the educational programmes and the supporting online infrastructure. The Innovation Engineering System's R&D team embraces an *engineering mindset* with all research. The team has analysed statistical differences between winners and losers, which are followed by educational programmes to increase the odds of success, which are followed by new concepts developed and tested to confirm or disprove the guiding principles. The discoveries are in many cases filed for patents.

Because the Innovation Engineering Institute views Innovation Engineering as a 'movement' and does not intend to deliver solutions to the end-users (e.g., companies or governmental agencies), they have designed a reproducible system (train-the-trainer approach, supported by an online infrastructure) and partner with already established players in order to build the local system for Innovation Engineering and to create impacts at local organisations and companies. Most commonly the local (e.g., a state in the United States) system comprises three main stakeholders: the Innovation Engineering Institute, the government and universities. However, non-profit organisations such as chambers of commerce, incubators and large corporations also play a role.

There is also an additional stakeholder, known as a 'connector'. The connectors are lawyers, accountants, or anyone else that provides services to, for example, SMEs. They are viewed as excellent fuel for the system; in addition to their already existing relationships to SMEs, they usually work with people high up in the SME organisation—for example, the CEO or the CFO—and they therefore commonly have good insights into what is going on in the company.

Each of the stakeholders takes different roles. In the U.S.-based Innovation Engineering System, the universities take the lead in education (they create a community base for staffing and add credibility to the programme). The Innovation Engineering Institute takes the lead in developing methods and tools. Large corporations' funds are important to the programme. They pay for training, license the methods and tools, and use the system to build private Innovation supply chains connecting their vendors, employees, and customers.

Government takes a role in supporting education and building an online infrastructure (the National Innovation Marketplace). The government in the form of NIST/MEP also takes the lead in funding, as do other stakeholders who have a shared interest in helping to deliver solutions to SMEs. The range of investment over time, by region and industry

sector, varies wildly depending on local customs regarding how support for SMEs is provided. NIST/MEP is made up of a national team that distributes funding to 60 MEP centres across the USA that use that funding in support of the NIST/MEP mission, to help grow U.S. manufacturers. The national team often finds resources and approaches that the centres can use locally to help manufacturers. The Innovation Engineering Leadership Institute was one of those initiatives. Local MEP centres would alert the national team that they were interested in hosting an event in their area. The national team would help coach them to recruit manufacturing companies to come and help cover some of the costs associated with the event, like sponsoring the event. NIST/MEP has many local offices (350) with strong personal relations with local businesses, which are viewed as key for the programme. Often these local offices are at university campuses, where they also have good contacts with technology transfer people. The MEP offices are compensated according to the model: one-third federal funding, one-third state funding, and one-third from companies.

The exact design of the Innovation Engineering System varies from region to region and depends on issues such as funding, skills, capacity, and political issues. In many countries the Innovation Engineering Institute partners with local providers the government is comfortable working with and who can help with customization to local cultures and situations. The system is dynamic and open in the sense that new methods and tools are continually added and that no exclusivity is offered. The aim is instead to train and certify as many as possible.

Design of sub-processes

The Innovation Engineering System is designed to be scalable. Below the four phases—train the trainer, engage the customer, deployment and sustaining the solution—will be described.

A great many efforts have been made in training individuals—for example, MEP advisors or people at large corporations—in the skills in Innovation Engineering. As part of the training programme, they are also trained in proactively selling the approach to their customers. Individuals who demonstrate mastery of the principles and skills required to help organisations create, communicate, and commercialise meaningfully unique ideas with increased speed and decreased risk are certified as Black Belts and viewed as thought leaders that guide the 'movement'. In order to be certified as a Black Belt, the individual must master the 48 skills, 12 in the area of 'create', 12 in the area of 'communicate', 12 in the area of 'commercialise' and 12 in the area of 'accelerate'. The training technique is called Cycles to Mastery. The teaching is based on Benjamin Bloom's (1984) work; he found that 94% of students could achieve, with specialised one-to-one tutoring, the same level as the top 10%. The problem was that it was too expensive to implement. The Innovation Engineering Institute processed these thoughts through computers and a couple of inventions. Currently, they teach one skill with sub-skills per week through a 'feed forward' instruction-by-practice system of learning cycles. The learning cycles include a combination of a digital class (videos, text and a quiz, out of class), a lab class (assignments and check, weekly in class), an application class (assignment and check, weekly in class), a reflection class (assignments and

check, out of class), and an experience class (real-world, real life challenges) (Hall, 2012). In each step an instructor checks the individual's sub-skill and adapts next class accordingly. In this way the system continuously raises the standard. The training had previously taken 18 months, perhaps because the individual in training needed to lead one project herself/ himself and take part in another project. The requirement now is to decrease the 18 months to three-to-six months. The Black Belts become the primary change agents driving the 'movement' forward. In addition, according to the Innovation Engineering Institute, Black Belts provide 6-15 times the value of Green Belts (explained below), and 40 times the value of a non- trained person. Currently, the Innovation Engineering Institute has 350 people going through the process to become Black Belts and about 50 who are already certified.

According to the Innovation Engineering Institute, selling innovation to companies is very difficult. They say they have spent as much time on how to engage and sell as they have spent on how to innovate. A few are interested and want to invest in it, but it is then extremely difficult to reach others outside this small group. A critical step is to teach and train Black Belts in how to approach companies (complemented with methods and tools through which companies can go through a trial period and learn, e.g., at the Leadership Institute). One starting point when reaching out to companies is to ask them where on the growth curve they perceive themselves to be. Most companies perceive themselves to be at the top or on their way down. This insight then leads to a discussion on how to change this and how innovation can re-launch the growth curve. According to one interviewee, it is crucial at this step to have an open and honest conversation with the leadership of the company. Assessment tools have not been found to be as effective as this open and honest conversation with the leadership. Two common concerns for the CEOs are that innovation is too slow and that innovation is too risky. The Innovation Engineering System programme is then 'sold' as solving these two issues. As the leadership starts feeling an interest and a desire to learn more and give it a trial run, the leadership institute (a three-day programme) is offered. However, there are also other 'moderately' intensive offerings such as a 'Jump start' on a particular area. The offerings are divided into three main parts: training solutions to educate and create a desire for and a feeling of the feasibility of the innovation engineering solution (three days); the jump start on an area (30–90 days); and deployment of a solution (6–12 months).

According to the Innovation Engineering Institute, the hands-on leadership engagement in the deployment of Phase I is critical. The problem is, according to them, that 85% of the leaders of companies, colleges, and government agencies lack the confidence or skills to lead their organisations in the transformation from a culture of reactive cost control to one of proactive innovation-driven growth. In order to build this confidence and these skills, the Innovation Engineering approach is based on 'waves' of experiments. This means that before the process of transformation to an innovative mindset starts, a number of low-risk and low-stress experiments called 'innovation waves' are conducted. These are generally three-month experiments utilizing small teams of volunteers who learn and apply the new mindset on some projects. The first wave of

team members is identified with the support of the Innovation Change Agent Identifier. This is a set of 21 questions developed to identify individuals with the traits of those who are most likely to take early and significant action on innovation. The three mindsets and their component traits that make up change agents include: entrepreneurial (an adventurous and aggressive learner who is comfortable with multi-tasking and uncertainty), optimistic (positive attitude, high energy and healthy self-confidence), and proactive scientist (a personal passion for mining, discovering, and applying technology, facts and data).

The early adopters are trained to be certified with a Green Belt (a 'light' version of the Black Belt training) and become the first group to be affected by the new mindset and practices. After this first wave, a second wave of people might be needed. When management finally feels confident that this is the way they want their culture to be, all employees are trained. This path is called the Waved Approach and is built up on three-month experiments, called 'innovation waves'. As a result of the Green Belt programme, which trains employees to be Green Belts, everyone, every week, is expected to come in with ideas. The system for managing these ideas is the innovation engineering labs.com platform. The culture then changes from cost driven to an innovation driven. The pace on this overall deployment process depends on the company. In some cases, the CEO already has the confidence and knows what innovation can do for the company, and the process then goes faster.

The Innovation Engineering approach on a process level is based on experimentation, much like agile development (fail fast, fail cheap). Weekly meetings increase speed and reduce risk. There is a monthly workshop where the data is analysed and lessons are drawn. The methodology is thereafter adapted to be more effective. It is clearly communicated that the consultants do not know how to innovate in a specific firm, but that the company itself does. The pipeline of innovations and the bigger picture are analysed on a quarterly basis to see whether the innovations have steered the company to where it wants to go or whether resources should be diverted in a different way. A Black Belt usually drives the methodology.

The process of educating and training Black Belts (change agents) is the main means used to sustain the new mindset and practices in the organisation that is going or has gone through a transformation. However, the increase in confidence among leaders also increases the possibility of sustaining the new mindset and practices. A further means for sustaining change is the innovation engineering labs portal, through which new insight; advice and learning are distributed and shared daily.

Metrics

The Innovation Engineering Labs.com portal provides different metrics. The portfolio of metrics is focused mainly on innovation system metrics such as the innovation pipeline (value, success curves between stages and cycle time); engagement metrics, such as the number of employees trained as Green Belts and Black Belts; the number of projects for which Black Belts are listed in a leadership capacity; the number of idea requests; and the number of ideas. On a team or company level there is also a culture

assessment index score, through which the team or company can measure its 'innovative climate' in the form of its ability to generate and commercialise ideas.

Finally, there are sales system metrics, for example, the number of face-to-face meetings held with leaders of prospective client companies, and education metrics, such as the percentage of students achieving mastery and the percentage of correct answers on the first try of quizzes and assignments.

Follow-up metrics are still being debated as of December 2012, and the metrics are continuously developed and improved.

Effects

No financial data has been identified or given during the project. The efficiency metrics provided in interviews and in documents include data such as $4.1 billion worth of ideas in the innovation engineering labs portal, a 250% improvement in the innovation success curve, instruction for 15,000-plus managers, and 70,000 engagements each month through the innovation engineering labs portal.

Further, in 18 months, the Innovation Engineering System has been applied at approximately 3,000 companies and 300 MEP advisors have been trained (50 certified) to become Black Belts in Innovation Engineering.

The interviewees do not perceive the system to be scalable enough, however. For example, the extension of the programme to more universities (100 on the waiting list) was stopped because it demanded too much investment. For this reason, there is a backlog right now because the cost-per-benefit ratio did not make sense. Both the US Senate (Portman) and NIST/MEP (Roger Kilmer) emphasised reducing the time it takes to train the trainers. The result is the goal of reducing the length of training from 18 to three-to-six months, as was mentioned earlier in this case. This will be achieved through improved logistics and the Cycles to Mastery approach.

Lessons learned

The Innovation Engineering Institute has learned a number of important lessons during the years. First, selling innovation to companies is very difficult. They have spent as much time on training how to engage and sell to potential clients as they have spent on actually training how to innovate. This is especially hard with companies that are on the downward side of the life cycle. They are extremely resistant to 'restart' because they do not have the time or energy to do it. In this life phase and even earlier, most companies have a reactive mindset and are not searching for nor do they have any desire to change. Because a governmental programme needs to target these companies as well, the system for engaging the customers needs to be well designed and initially focussed on education rather than on selling an idea or solution. The companies need to understand why they should focus and invest in innovation; in order to convince them, the programme must be good at communicating its benefits and meaning. The packaging of the methods and tools is important because that gives the companies something to hold on to. The first focus should be on proactive activities, then on gaining momentum by

creating some successes and small communities of people that love the programme. Together with these people, the concepts are further developed. The programme also needs to be very simple. Simplify the communication and the solution in making it is easy for both the consultant and the company to understand. In addition, be patient and focus on people that are committed for the long haul. It might take 5-10 years to get everything in place, but there is no other option. Further, use a partnership approach. The private and government sectors need to work together and create a willingness to test and learn over time in order to continuously improve the design of the programme and the object. Run a lot of tests and have an honest relationship with the funding organisations and communicate that there is a need for testing and learning. The programme and its co-ordinator will need the space and an honest relationship with everyone involved. In addition, the best return in job creation on government funding is from investment in companies with more than 100 employees. Finally, a proactive or reactive mindset in the company is correlated with their age, number of patents, and size. A higher age, fewer than two patents, and more than 200 employees positively correlate with a reactive mindset.

Next step

The Innovation Engineering System is continuously developing. Due to limitations in capacity and time needed to build a solid foundation for Innovation Engineering, the Innovation Engineering Institute has consciously kept a low profile during 2012. According to the Innovation Engineering Institute, they have now left the alpha mode and are now in a beta mode.

The plan for 2013 (Hall, 2012a) is to begin the process of building scalable systems for awareness building. The institute also has set a number of research and development priorities for 2013. Priority 1 is to optimise the patent-pending Cycles to Mastery teaching methodology. Priority 2 is to bring more intelligence to frontline work teams through improvements in the Innovation Engineering Labs.com portal. The expectation is that government funding will stay at around the same level in 2013, whereas the funding from large corporations will grow. Priority 3 is forensic analysis methods to enable calibration and risk forecasting. Finally, priority 4 is the five-year life cycle, which makes it possible to do a five-year forecast of innovation life cycles.

In addition, there will be a focus on how to disseminate the programme nationally and internationally. The Innovation Engineering Institute is currently looking for two countries that have a desire to become part of the global leadership of the movement, to help them optimise the programme. An Innovation Leadership Retreat schedule is set for the UK, 13-15 February 2013. In a case where a national innovation agency would like to roll out a similar programme, it always should start with a pilot programme in one region, industry sector and/or college. Depending on the breadth and condition of the country's culture, Eureka!Ranch has estimated the total cost (government and/or industry) as between $1 million and $5million per year with the cost stepping down over a five-year period as local resources are developed. A quantitative cultural

assessment is available to get a better sense of the country's culture in both the private and public sectors.

Researchers' reflections

This programme is a very good example of a continually evolving design where identified weaknesses become challenges to overcome. The programme also openly addresses its shortcomings and its ongoing process of improvement – which is a good indicator of an emphasis on learning. All programmes investigated showed varied degrees of learning, improving both content and ways of interacting with end-clients, but Innovation Engineering System was one of the most willing to share from the experiences of being on such an improvement trajectory.

A basic premise in Innovation Engineering System is to develop a product and a sales process that is attractive enough to make it commercially viable for consultants to upgrade and become Black Belts in Innovation Engineering. For this reason, it has clearly identified unique selling points; the consultants are trained to engage the potential client (sales training), and they present the solution as complementary to the company's existing solutions—for example, a Stage-Gate® approach—instead of competing with it. Further, the idea of the Black Belts in Six Sigma raises the attractiveness of a programme that provides a diploma for thorough training that provides competencies that directly can impact a company's bottom line.

It is very difficult to construct good metrics for measuring the impact of interventions on stimulating innovation in existing companies. As a result, most programmes use activity data in relation to programme goals and some use mainly qualitative data based on clients' perceptions of the programme's impact. Innovation Engineering System, in addition, has developed a number of metrics that are different and more closely related to the product development process. One measure is the estimated value of the generated product development projects in the pipeline. This metric is extremely hard to calculate for obvious reasons, but Innovation Engineering System relies on an algorithm based on research and company data. Other output measures are the number of idea requests and ideas. In addition, there is perception data on the ability to generate and commercialise ideas. These kinds of output indicators are not common on the programme level, but they are an interesting complement to the above-mentioned more frequent activity and perception-based indicators.

In Innovation Engineering System the above metrics are included in a real-time Black Belt database with data from all ongoing projects. Each development team is required to identify the target group for their innovation and the potential value of the innovation (based on an algorithm developed by reference to established research and company experience). The advantage to this system is that it helps the development group early on to focus on who the customer will be and how it will be possible to get payment for the innovation. The risk to this system is that the innovations selected are the ones easy to estimate benefits from. There is a risk of 'false no's' (Chesbrough, 2003)—that is, saying no to innovations that are discontinuous and that may turn out to be disruptive (e.g., Christensen, 1997). In comparison, in order to avoid a false no, Google tells its

engineers to focus on user needs and not to bother with how to make money at an early phase, to encourage them to come up with more creative ideas (Steiber & Alänge, 2013).

Innovation Engineering System is in the process of developing a more efficient way of training Black Belts because the present training time of 18 months is perceived as too long. Also in comparison with Six Sigma Black Belt training, including training sessions and a project that typically takes around six-to-eight months, the training time seems to be very long. However, their ambition is to train and develop change agents that can contribute to a sustained change in Innovation Management, and that could demand a combination of training followed by experience and follow-up training in order for the programme to develop enough credibility. Innovation Engineering System has ideas for speeding up training by making it more efficient in combination with experience sharing through an Internet-based learning network where different change agents can discuss their experiences and get help with urgent issues. CENTRIM, by comparison, offers direct telephone support to their trained facilitators to discuss urgent matters. This points to the necessity of building a system where trained change agents can get further counselling after the initial training and accreditation.

4.4 GrowthAccelerator

Summary

GrowthAccelerator is a short programme (three years) to boost high-growth-potential SMEs in the UK. ‘A high growth potential SME’ is defined as a company that has had an annual growth rate of between 10- 20% over the past three years. Further, these companies are often older than five years, have leadership capability in terms of qualifications and previous corporate experience, have leaders with the ambition to grow, and have a robust growth strategy. In many cases, innovations are co-produced with customers, strategic partners, and technology providers. The company also must show an absorptive capacity for both technology and business competence, and be able to develop a unique selling proposition. The company must further have fewer than 250 employees and a turnover below £40 million. Approximately 26,000 such companies have been identified in the UK.

The programme is based on experiences from earlier regional ‘high growth programmes’ over the past 10 years, and it is managed by a consortium called GrowthAccelerator, consisting of Grant Thornton UK, Pera Consulting, Oxford Innovation, and Winning Pitch. The consortium responded to a government tender from the UK government department for Business, Innovation & Skills. The overall goal is to create 55,000 new jobs and £2.8 billion of total growth. The contact with a potential client is through a combination of an initial telephone conversation with a Growth Manager (and potentially also a short face-to-face meeting), a standardised online assessment called GrowthMapper that produces a standardised Insight report, and then a three-to-four hour face-to-face meeting with a Growth Manager. Consultancy services are then offered the company, based on weaknesses and strengths identified in the Insight report. The set-up

of the programme includes actors such as the main partners, who have a geographical responsibility, and regional actors such as intermediaries and consultants. Growth Managers act as primary contact persons for the companies over the whole project period (6–12 months). The Growth Managers conduct a diagnosis and support in setting a growth strategy for the companies. The Growth Managers connect the companies to consultants called Growth Coaches, who belong to a pool of 1,000 experts. The consortium relies primarily on their own earlier contacts and partners in building the pool of experts. Central marketing from GrowthAccelerator together with viral marketing between the consultants themselves also have been used as marketing channels. The applicants for Growth Coach are evaluated through a two-day coaching assessment. The consultants commonly have industry experience, have started their own companies, and have an ability to talk with the companies in a credible way. The consultants are found in a wide area of expertise such as accounting, marketing, IPR, and technology. The consultancy is quality assured by the two-day coaching assessment, receiving strict and regular feedback from the SMEs about the coaching, and the requirement that all coaches or experts follow the stipulated conduct and performance. A lesson learned is that it is very important that the management teams in the client companies are buying into the project and view themselves as becoming leaders of a high-potential company. Hence, the ability of the Growth Managers to identify a potential high-growth company with the right leadership becomes essential.

Background and purpose of programme

GrowthAccelerator is a private-sector service to accelerate the growth of England's most promising 'high-growth-potential companies' by connecting them to business growth specialists who can deliver tailored advice for growth. The GrowthAccelerator programme will focus its efforts on identifying at least 26,000 companies in England that have genuine potential for rapid and sustainable growth, defined as having the capacity, commitment, and intent to double turnover or employees within three years—a small percentage of the millions of the country's registered businesses. The ambition is to create 55,000 new high-value jobs with the help of relatively young and fast-growing companies. The programme is a partnership between private enterprise and the UK government department for Business, Innovations and Skills (BIS). The private partner consortium is led by Grant Thornton and comprises Winning Pitch, Oxford Innovation, and Pera Consulting as the four leading partners, together with seven other local delivery partners.

The UK government presented a call for tenders in 2011 (Business Coaching for Growth). The GrowthAccelerator consortium was awarded the contract following an open and competitive procurement that used a process of dialogue to refine the specifications for the service to make sure it would meet the needs of potential high growth SMEs. The GrowthAccelerator programme was launched in January 2012.

The ambition is to help business leaders in England who are passionate about growing their business and have the intent to double their business in three years to achieve their ambitions.

Uniqueness

GrowthAccelerator is three-year programme specifically designed to boost growth in high-growth-potential companies in England through intensive coaching adapted to the specific needs of each individual company. The UK government has tasked the Growth-Accelerator consortium to work with 26,000 businesses and create 55,000 new jobs and £2.8 billion of growth in three years; there is a penalty clause if this is not achieved.

Identified results

GrowthAccelerator is a new programme started in January 2012, but based on experiences from eight earlier regional 'high growth programmes' over the past ten years. The ambition for 2012 was to reach 6,000 high-growth-potential companies.

A number of success stories are described on the GrowthAccelerator Website using case studies from the previous programmes whilst new success stories are generated. The design of the present programme builds on previous regional programme experiences, and the business coaches involved in the described success stories from the regional programmes are now also part of the 1,000 experts working within the Growth-Accelerator programme.

Experiences from the regional programmes convinced the UK government that 'high growth' programmes can provide substantial results and contributed to the government's decision to put £180 million into the programme. The total investment is £300 million, the additional £120 million coming from a mix of private and public sources, including the EC funding.

Object and theoretical background

Object

From the perspective of the GrowthAccelerator, the first step is to identify potential clients in a number of ways. First, the main partners have geographical responsibility and use intermediaries such as chambers of commerce and regional actors, including GrowthAccelerator's pool of business coaches. GrowthAccelerator also does marketing about the programme and analyses official statistics to identify high-growth-potential companies through their official accounts for the past three years. Based on these analyses, contacts are made with companies. However, there is also a possibility for presumptive clients to contact the GrowthAccelerator themselves in order to enquire about the programme and tell about their interest in participating.

A potential client company is first introduced to a Growth Manager. The Growth Managers will get to know the business and will guide it through every stage of the service. A Growth Manager will have a 30-minute phone conversation during which he/she will establish the company's management ambitions, the capacity of the management team and the premises, and the potential growth opportunities for the company's products or services, as well as the markets in which they operate. At the end of this call they will generally be able to determine whether GrowthAccelerator is right for the company, although they will be able to test this further if necessary during a subsequent face-to-face meeting.

If the Growth Manager finds that the company seems to fit the high-growth-potential profile, then the company will get access to an online assessment tool called GrowthMapper™, which is a tried and tested way of identifying barriers to business growth (ten business areas with ten questions on each). This will take around 15 minutes to complete. The business areas considered are strategy, cash, marketing and sales, leadership, access to finance, innovation, people and skills, operations, sustainability, and change. For best results, each member of the management team should complete GrowthMapper™. The output from GrowthMapper™ is an INSIGHT-report that shows the relative strengths and weaknesses and puts the key business growth issues in focus for the leadership team.

Once the company has completed the GrowthMapper™ assessment, a three-to-four-hour face-to-face meeting with one of the Growth Managers will be booked. This is a working session to really get under the skin of the barriers to growth and to agree on the scope of support. The Growth Manager will use all this information to find a Growth Coach to work with the company. GrowthAccelerator has access to a network of 1,000 experts nationwide.

The offer then depends entirely on the business's specific needs and "*it could be anything that the company needs to get onto a high growth path*". For example, it could be the need for development of new products, commercialization of new products, or exporting. But it can also be organisational innovations, such as changing the way the company grows; it can be technical, it can be operational improvement, such as making operations leaner, or it could be skill based. The priorities are jointly decided between company management and the Growth Manager. GrowthAccelerator can offer help with raising money (access to finance), implementing a tailored business growth strategy (business development), or bringing a new product to market (commercialising innovation) or implementing an organisational innovation. The company can also get a leadership and management grant of up to £2,000 per individual (to develop leadership skills). An integrated package to help the company to reach an agreed-upon growth objective is created, and a Growth Coach will pass on skills, knowledge, and experience to improve business performance and help the company realise their growth potential. Coaching support will typically run for a period of several months (6-12) to enable the company to implement significant changes, and the total number of days available for each company will be about 7-15 days maximum. However, in between that the client gets support at its premises, and there will be a number of things that the client needs to implement and change. The clients will also be able to attend a range of master classes, workshops, networking and mentoring opportunities and get access to peer-to-peer advice. And they will benefit from privileged access to a Leadership Development fund to support their skills development.

This programme forms part of a package of government support for small and mid-sized businesses, including the Business in You campaign to encourage people to start or grow their businesses, the improved Business Link website (www.businesslink.gov.uk)

and the mentoring portal (www.mentorsme.co.uk), which provides a single point of access for those seeking mentoring and those seeking to be mentors across the UK.

GrowthAccelerator expresses its 'service value proposition' as:

> *"We identify the best course for a business and match them to proven business experts and support to realise controlled, accelerated growth. We discover new insights and direction for a business to turn an ambition to grow into reality. We define business support and match business experts specifically around our clients to double their business in three years. We drive with them to equip their business to realise accelerated and controlled growth. All the time giving them access to the networks that were previously closed, and staying with them on their journey"*
> (Pera Consulting PowerPoint 'Creating Growth and Opportunity').

Theoretical background

GrowthAccelerator is a new programme helping England's brightest businesses achieve their ambition and potential. BIS (Department for Business, Innovation & Skills) is investing nearly £200 million in GrowthAccelerator because the evidence is clear that fast-growing small businesses generate a very high proportion of economic growth and jobs in the UK.

The aim of GrowthAccelerator is to increase the number of small businesses that achieve rapid growth. It will help small businesses with potential overcome barriers to growth and make a significant contribution to the ambition of a private-sector-led recovery.

Delivered by the private sector for the private sector, GrowthAccelerator provides high-growth-potential small businesses with the know-how and ability to achieve sustainable growth. Proven business experts work with business leaders to tackle issues such as (1) developing and delivering a tailored growth strategy, (2) becoming investment ready and securing finance, (3) commercialising innovation effectively, and (4) developing leadership and management capability.

GrowthAccelerator also connects clients with trusted local sources of business advice: for example, UK Trade & Investment, business incubators and specialist professional services firms, as well as investor and business networks. The Leadership and Management Advisory Service (LMAS) is now delivered as part of GrowthAccelerator. The new arrangement will ensure that more grants at lower costs are given to businesses that are capable of achieving growth.

Although the GrowthAccelerator is a new national programme, it is based on the experiences from eight earlier regional 'high growth' programmes. These regional programmes had both successes and failures. Based on the successful cases, the government realised that it was possible to get results from a high growth programme, and GrowthAccelerator is designed to use lessons learned from the earlier programmes. For example, the East Midland High Growth programme was established in 2002 and

was one of the most successful programmes. Many of the available 'growth coaches' have been involved in the regional high growth programmes as well and bring their experiences to the new GrowthAccelerator programme.

According to the EC Community Innovation Survey 4, barriers to innovation can be cost factors, knowledge factors, market factors, and regulation factors. Access to finance can be a barrier because of the perceived excessive economic crisis, too-high direct innovation costs, and the costs and availability of finance. Further, a lack of qualified personnel and a lack of information on technology and markets can hinder innovation. Market factors such as uncertain demand for innovative goods or services or markets dominated by established enterprises can hinder innovation. Finally, a need to meet EU and UK regulation can function as a barrier to innovation. The Growth-Accelerator purports to satisfy business needs for a culture of innovation, which can be influenced by organisational innovations, leadership and management skills, and workforce training. Innovation processes can be improved by introducing structured company processes, external coaching advice, and adoption of best practices. Finally, exploiting IP, technology partnering, and research can lead to product innovation.

Target group(s) and underlying philosophy

Target group

The target group is SMEs registered in England, employing fewer than 250 people and with a turnover of less than £ 40 million. The investment is in:

- Micro and start-up businesses (0 to 9 employees) – £600
- Small businesses (10 to 49 employees) – £1,500
- Medium-sized businesses (50 to 249 employees) – £3,000

The target group does not include all SMEs, however, and hence is a clear change in focus in comparison to earlier UK programmes for SMEs, which were targeted at all possible companies in need of support. In the GrowthAccelerator the target companies should belong to a high-growth-potential company group.

Underlying philosophy

The selection of the target group is based on research on characteristics of companies that create new jobs. In any economy, most new jobs are created not by large companies or new start-ups, but by so-called high-growth companies. According to a UK study (NESTA, 2011), this group comprises 6% of all SMEs, but they generate 54% of all new jobs. In the UK, a high-growth company is defined as one that has grown by more than 20% per year during a three-year period. Further characteristics of high-growth SMEs are, according to Taftie (2012), that 70% of the high growths are more than five years old, that they have leadership capability in terms of qualifications and previous corporate experience, and that the leaders have a growth ambition and a robust growth strategy. They are linked also to other companies in various ways, including pre-incubation as part of other businesses, export activity and connectivity to markets through partners, and support network connectivity regarding both business and technical areas. Innovations are co-produced with customers, strategic partners, and

technology providers. They also show an absorptive capacity for both technology and business competence, and, finally, they are able to develop a unique selling proposition (USP).

Taftie (2012) also refers to research on innovation in SMEs, stating that although high-growth SMEs are more likely to use strategic innovation based on cutting-edge in-house research than are 'normal' SMEs, twice as many (24%) high-growth SMEs utilise the mode of Intermittent Innovation, preferring to innovate around market opportunities when they occur and often outsourcing the R&D to external actors such as universities or research institutes. This led Taftie (2012) to indicate that intermittent innovators, who are twice as common among high-growth SMEs and more effective in generating growth from lower investments in R&D, could represent a far greater potential return on government investment in R&D – which thus should be reflected in the design of programmes. However, more than half (51%) of High Growth SMEs do not innovate technologically at all but use various forms of non-technological innovation to deliver new value to customers. This kind of research on the characteristics of high-growth companies is behind the design of the GrowthAccelerator, which focuses on not only on a specific approach to innovation, but instead starts from each company's specific needs in order to remove obstacles and stimulate growth.

The UK government wanted to find those companies that could be the upcoming high-growth companies (the ones with previous track records as high-growth companies are not included). In the GrowthAccelerator programme, these high-growth-potential companies have been carefully defined as companies that have grown by at least 10% per year over the past three years – but not more than 20% per year.

Overall geographical scope and design of programme

Geographical scope

GrowthAccelerator is a national programme in England – developed based on earlier regional efforts. The main partners are responsible for different geographical areas. Simultaneous to the start of the GrowthAccelerator programme, the Regional Development Agencies were closed by the UK government.

Set-up of programme

The GrowthAccelerator is a partnership between business growth experts Grant Thornton UK LLP (financing and lead partner), Pera Consulting (growth coaching and innovation), Oxford Innovation (financing) and Winning Pitch (growth coaching) and the government department for Business, Innovation & Skills. The consortium of four partners responded to a government tender, and their bid won the competition for the programme.

Sixty additional organisations are involved in the second tier of partners, including leading commercial banks, large enterprises, or the Institute of Directors, an influential and respected membership organisation in the UK. Members are skilled and experienced business leaders in the country, representing the full business spectrum - from start-

up entrepreneurs to directors in the public sector and CEOs of multinational organisations.

The GrowthAccelerator recruits many small and large consultants with the offer that *"a tailored package of support on offer can dramatically speed up your clients' growth by bringing new ideas on business development, finance, innovation, leadership and management. As someone already working with them, you're ideally placed to hunt out the businesses able to turn that advice into hard results – businesses that you can showcase as they grow"* (GrowthAccelerator homepage).

The homepage is, however, only an information site, and the way of identifying and recruiting 1,000 Growth Coaches follows primarily other channels. Primarily the consortium relies on their own earlier contacts and partners from earlier projects, which makes them secure that they know they can rely on their coaches. However, even though four main partners with a broad contact network are involved, the goal of recruiting more than 1,000 consultants demands supplementary channels as well. One major way of identifying potential consultants is through the consultants themselves – by word of mouth or 'viral marketing', they hear from others about the high-profile programme that they should be involved in, and they apply to get in. The new applicants are then evaluated through a two-dedicated days' coaching assessment process. Most of the business coaches are freelance consultants who have industry experience, have created their own companies before, and have an ability to go into a company and speak with them and be credible. They have a wide area of expertise because the needs of the high-growth-potential companies can vary considerably. For example, among the coaches are experts in accounting, marketing, IPR, and technology. During the first year of GrowthAccelerator, the demand for financial support has been limited, whereas there has been a huge demand for intellectual property management, although this demand might change during the project period. Usually a growth coach should not work with more than three or four companies each year, and they must make sure that these three-to-four companies reach their output. A growth coach thus would spend a maximum of 60 days at four companies per year (using the maximum 15 days per company).

The Growth Managers are a critical group in the GrowthAccelerator because the programme relies on their competence in diagnosing and in supporting and setting a growth strategy for the company. They also are essential for identifying and referring companies to suitable experts and in monitoring the process over the full period of intervention. They are trained to understand all the methodology and diagnostic tools used. These Growth Managers are selected based on a number of criteria. Most Growth Managers have been working with the partners in the consortium for years and are known to be reliable.

Metrics

The GrowthAccelerator programme is based on a contract between the UK government and the GrowthAccelerator consortium with clearly stipulated conditions and metrics. There are three goals, out of which two have metrics and goals that need to be attained in order for the consortium to receive payment – or in case the goals are not reached,

penalty. These goals are the overall job generation of 55,000 jobs and a total growth of £2.8 billion needs to be generated in three years. The government also wants to check specifically that the new jobs are ‘proper jobs’.

Strict and regular feedback from the SMEs about the coaching and accounting links to the consortium’s obvious need to make sure that all coaches follow the stipulated conduct and performance. If they are not delivering according to expectations, they are dropped from the GrowthAccelerator database. Because the Growth Managers are the primary contact point over the whole period (from initial diagnostic) of 6 to 12 months, they will be contacted if anything goes wrong with a specific coach.

Effectiveness

The total investment in the GrowthAccelerator programme is large, but due to the number of companies targeted (26,000), the actual support to each company is more limited. On the average £ 6,923in public money is available per company, if all 26,000 would share the UK government’s investment of £ 180 million. The effectiveness of the GrowthAccelerator programme as a stimulus to growth must be evaluated through the perspective of what this group of companies would have accomplished in terms of job creation and total monetary growth without this targeted stimulus. This kind of data is not yet available, however, because the programme has run only its first of three years.

Lessons learned from programme

Because it was recently started, there are not a great many lessons learned from the GrowthAccelerator programme. The programme co-ordinator pointed out, however, that it is very important that the management teams in the client companies are buying into the project and view themselves as becoming leaders of a high-potential company. This is why it is so important that the Growth Managers, based on the diagnostic and personal contact with clients, are able to identify what makes a decent initiative and a potential high growth company—and this is, of course, a mix of skills and behaviour.

Next step

The GrowthAccelerator, as a three-year programme carried out from 2012 to 2014, has ambitious goals and is in the middle of trying to realise those goals. Because of the design of the individual company interventions based on specific needs, the focus has been on some areas of expertise, for example, IPR, whereas other areas have not yet come into focus to the same extent, for example, financing.

Researchers’ reflections

Many programmes intend to target ‘growth-oriented’ companies but frequently have difficulties identifying and distinguishing the growth-oriented from the others. GrowthAccelerator uses a very clear definition to target its end-client, based on their growth rate over the past three years, complemented by data on their leaders’ capabilities to grow. GrowthAccelerator focuses on high-growth-potential SMEs, defined as having a growth rate above 10% but less than 20% per year. The cap on 20% is set because high-growth companies are defined as companies with a growth rate above 20%, and the

focus of GrowthAccelerator is to find the companies that have the potential to become high-growth. Hence, the initial way of identifying high-growth potential is clear-cut because it is based on the reported growth rate during three years and the capabilities of the leadership group, which put high demands on the skill of the Growth Manager making the initial analysis.

An evaluation of the GrowthAccelerator programme is tricky because of the target group selected and the choice to include all companies within this category of high-growth-potential companies. Although the total investment is large, due to the number of companies included (26,000), the actual support to each company is considerably lower than in many of the other programmes – on average, £ 6,923 per company. However, the selection of all existing high-growth-potential companies means that there will definitely be many examples of job creation, because this is the group of companies that create most jobs in any society. However, if the GrowthAccelerator programme will have any specific impact on this job creation, it will be very hard to find out – because these companies are the ones that would have created jobs regardless of any external input. The evaluation is also difficult due to the fact that the management practice to be changed is not the same in all companies, which is why a comparison of effects will be harder to achieve. In addition, the change to a specific management practice is rarely done in isolation because the company might change something else in parallel, which might be the real reason behind future growth. There will probably be some examples where the marginal effect of the GrowthAccelerator programme will be perceived as very important by the business owners, although in most (if not all) cases a number of important inputs led to growth and job creation. As a political endeavour, the programme seems to be quite safe, as this group of companies will create jobs. Because it will be extremely hard to evaluate the real impact of the GrowthAccelerator programme it will be possible to argue either that it has an important impact or a lower magnitude impact. A possible way to evaluate the program could be to look at the cohorts from the different years and evaluate their development – job creation does not always follow directly after an intervention, however, but important input could bear fruit several years later. This also brings up another issue – when does the government decide to evaluate whether GrowthAccelerator reaches its goals of creating 55,000 new jobs? Is it directly after the three years' project time, or will they grant GrowthAccelerator a certain grace period (one to three years)? If goals are measured directly after the three-year project period, there is a risk that the measurement will lead to a 'quarterly earnings' mentality—that is, a short-term view.

4.5 TYKES and Liideri, Tekes

Summary

TYKES and Liideri are part of a long-term investment from the Finnish government. Both programmes have been triggered by government visions, by good experience from previous programmes, and by national challenges such as the demographic change and a lack of strategy or plan for workplace development. In addition, previous Swedish, Norwegian, and German working-life development programmes acted as role models

and inspiration. None of the programmes have had as a purpose to disseminate a specific solution but rather have been intended to be an instrument to create generative ideas that could act as sources of encouragement, inspiration, and learning for workplaces and other stakeholders in Finland. Further, both programmes aimed to put in place a sustaining national infrastructure by both involving companies and researchers and being the driver for development projects at companies, by providing researcher education and training, and by reinforcing workplace development expertise based on research findings. Interesting results were made available in different formats such as presentations, research papers, and Web page information. To support adoption, training concepts were developed also, but there was no specific IT platform mentioned. The fact that government allowed tailored and demand-based firm solutions made it harder to evaluate and standardise results. The companies themselves also did not seem to have any incentive to disseminate their results; both standardisation and diffusion of the 'solution' was limited between companies, but not between researchers and consultants. In addition, the matter of making methods and tools accessible was found difficult to supervise.

The primary target groups were growth-oriented SMEs within industry, the service sector or municipalities, and researchers. Consultants, research institutes, and labour/employer organisations were also involved. SMEs were thought to benefit from the programmes because of their 'weaker possibilities to compete in skilled labour compared with bigger enterprises' and their lack of financial and expert resources available for the development of modes of operation. SMEs are also a strategic target group of Tekes in order to boost national growth.

Government runs the programmes. Dedicated governmental resources were connected with a regional network of people in employment and economic development centres. Outside this set-up there were stakeholders such as SMEs, researchers, consultants, research institutes, and labour/employer organisations. The consultants, researchers and research institutes were not educated or trained by Tekes. The companies themselves selected them, after Tekes had screened their résumés. The projects were between one and three years, and the methods used in the projects varied and depended on project goals and expertise of the consultant/researcher. Only the administrative processes were standardised.

Goals were on workplace, generative, programme, and public policy levels. Targets were set for each level, and results were regularly monitored. Evaluations were conducted midway through the programme and three months after the conclusion of the programme by a mix of people from Tekes and external people. More than 80% of company respondents said that the project succeeded quite well in using the experts and applying the methods. However, it was hard to identify whether new practices were a result of the programme or not. In addition, the development projects seemed to have been more successful in bringing about improvements in supporting practices, not in the organisation of work as such.

The budget was in average of €57,229 per development project, €416,000 per method development project, and €475,000 per learning network. Lessons learned were that the dissemination of methods among researchers and consultants was more successful than the dissemination of new practices to and among firms. Dissemination between firms requires active networking and the arrangement of events. Further, more packaging of results should have been done, a more focused target group should have been used, the commitment of management was crucial, as were the skills of the consultants and the project timetable. Learning networks driven by researchers meant a strong focus on the researcher's research and not on the workplaces' learning processes. The learning process was also challenging because it was hard to translate the concepts and methods of the learning network into more practically oriented language.

Background and purpose

The Finnish Workplace Development Programme (TYKES) was launched at the beginning of 2004 as part of the employment policy programme of Prime Minister Vanhanen's first governmental programme. TYKES continued the work started by the previous Workplace Development Programme (TYKE 1996-2003) and the National Productivity Programme (1993-2003). It was an umbrella programme with greater resources. The programme was trigged by good experiences from preceding workplace programmes and by a rapid demographic change, which called for new measures to boost simultaneously productivity growth and longer working careers. Previous Swedish, Norwegian, and German working-life development programmes also influenced TYKES. The workplace-level objective of TYKES was to help workplaces adopt new practices that would enable them to bring about simultaneous improvements in productivity and quality of work life (QWL). Productivity improvements, in practice, meant improvements in work productivity, product quality, customer service, throughput times, and so forth. Improvements in the QWL were manifested in employees' greater opportunities for learning and exerting influence at work. The most typical aims of TYKES development projects included the development of work processes, work organisation, working methods, and supervisory work. The idea was that the government, through tailored and demand-based activities, could significantly accelerate workplace-level development of productivity and the quality of working life as well as support research and development expertise. The vision was that by 2009 "*Finland will have a network of expertise for work organisation development which creates national competitive edge and which effectively promotes qualitatively sustainable productivity growth"*.

TYKES focused therefore not only on development projects among companies but also on research, researcher education and training, and the reinforcement of workplace development expertise based on research findings. By emphasising the significance of the research-supported development approach and the related expertise, the programme attempted to put in place a sustaining national infrastructure for workplace development, which would assist in the implementation of new programmes to follow the TYKES programme. TYKES ended in 2010. The two programmes TYKE and TYKES were guided by a set of principles, which have been called the 'Finnish model' for

workplace development. The principles were productivity and QWL; a system-level approach; local learning processes; labour-management co-operation; research-supported development; an expanded triple helix (close interaction among several clusters of innovation); and inclusiveness (fostering innovative development in many sectors of the economy). As a result of transferring TYKES to Tekes in 2008, the final principle was affected because Tekes' funding is steered by customer segmentation, which meant that the group of workplaces that may receive funding was smaller than it had been in the previous programme.

In 2012 (ending in 2018), the programme Liideri (Business, Productivity and Joy at Work) was launched, trigged by good experiences from preceding workplace development programmes and by a perceived need to launch a broad national workplace development strategy, co-ordinated by the Ministry of Employment and the Economy. Liideri aims to produce management and organisational practices that renew business activities and working life, as part of a broader national workplace development strategy. The vision is that "*Finland will have the best working life in Europe in 2020"*. Liideri's purpose is to be a next-generation workplace development programme that represents an approach in keeping with a broad-based innovation policy. At the project level this means an interconnecting link between traditional objectives and targets in the development of working life, on the one hand, and corresponding objectives and targets in the development of products, services, and business operations, on the other. The Liideri programme has two main focus areas: employee-involving innovation (refers to active and systematic participation of employees in ideation, innovation, and renewing of products and services and ways of producing them, with a view to creating new solutions that add value to customers) and research and development of new forms of work organisation. The programme is built on a number of principles thought to be important for future organisations. These are decentralisation, self-management, process orientation, customer orientation, emergence, and agility.

Uniqueness

The programmes are part of a long-term investment from the Finnish government. The programmes focus on creating higher productivity or innovation in parallel with, or as a result of, an improved quality working life. Further, the goal was not to disseminate a certain solution but instead to create generative ideas acting as sources of encouragement, inspiration, and learning for workplaces and stakeholders in the Finnish private and public sectors.

Identified results

The central aims of the TYKE/TYKES programme were:

- To develop Finnish workplaces in order to improve both productivity and the quality of working life at the same time
- To promote interactive learning by creating arenas between workplaces and development experts to exchange information and experiences
- To strengthen the expertise of researchers and developers of working life

- To strengthen the mediation of new knowledge and expertise through the research and development units and the educational institutions
- To create new forms of interaction between various interest groups
- To bring questions of working life into public attention and discussion

Each programme has been or will be carefully evaluated by Tekes. In the evaluation of TYKES, the different interest groups involved reported that all aims were viewed as fairly well fulfilled. Among other things, the programme resulted in increasing the development activity and expertise in relation to working life in SMEs and resulted in numerous product innovations. In addition, based on the interest groups' views, the need to develop working life programmatically has increased somewhat from 2007. In addition, an international comparison showed that the integration of the development of working life as part of R&D&I in the public sector has an especially strong presence in the Nordic countries. However, the programme did not succeed as expected in producing platforms for the dissemination and distribution of expertise. Only a few of the people involved in the development projects said that they had learned from other companies included in the project or benefited from the events of the TYKES programme.

The central aims of Liideri are:

- Companies that participate implement organisational renewals, which create preconditions for a sustainable competitive edge
- Increased knowledge of universities, research institutes, and universities of applied science on how to utilise and develop employees' skills and competencies, initiative, and creativity in business activities
- Work organisation development and the development of products, services, and business activities become better integrated in companies
- The role of development networks is reinforced in workplace and company development
- Companies' activity to renew their work organisation and business activities in line with the programme vision is increased

The results of this programme are for natural reasons not yet identified. Mid-term evaluation of the programme will be carried out in 2014 with a final evaluation in 2018.

Object and theoretical background

Object

The aim was and is to disseminate new organisational practices and development methods, models and tools created and tested in projects. The focus is not to disseminate these as such however but to create generative ideas acting as sources of encouragement, inspiration, and learning for other workplaces and stakeholders. The programme therefore did not try to package everything, but interesting results were available for others in different formats such as presentations, narratives, research papers, Web page information, and interactive events. However, because the starting point of the TYKES programme was that new products must be the property of many

because public funds have been used to develop them, the projects were required to provide information on their products in an understandable form so that other experts were able to use them. However, the work organisations often stated that they had no time or interest for the dissemination of the results, which limited the diffusion of the 'object'.

Further, the aims of the development projects at SMEs were heterogeneous because each workplace defined the aims from its own starting point. The development project had a central role in solving the development challenges caused by discontinuities in the company, such as growth, organisational change, and changes in the operating environment.

Theoretical background

There is no specific theoretical background. However, the design of the TYKES programme was influenced by configurational organisational theory. Further, the learning networks were based on an interactive 'open innovation' approach.

Target group(s) and underlying philosophy

Target group

The primary target group in both programmes was and is growth-oriented SMEs. This is especially emphasised in the Liideri programme. The primary target group in the Liideri programme consists of SMEs, which pursue growth from an innovation-derived competitive edge in their business activities.

Within these growth-oriented SMEs, the target is primarily senior management or, in the case of bigger organisations, HR or production managers. Somewhat more than a third of the funding was directed to industry, just under a third to the private service sector, and just under a fourth to the development of workplaces in the municipalities and federations of municipalities. To obtain approval as a TYKES project, a project of organisational development must fulfil six conditions set by the programme:

- The project furthers both productivity and the quality of working life
- The project develops the workplace's ways of operation in a wide-ranging way
- The management and employees of the workplace are committed to the project's aim and realization
- The project has concrete aims and methods of evaluation
- The project is viable
- The applicants accept the methods of the programme

Alongside the development projects at companies (996 in the TYKES programme), the programmes also funded research-oriented method development projects (25) and learning network projects (16). The applicants for method development projects and learning networks projects were the universities, research institutes, and universities of applied sciences (polytechnics). The requirements on the method development projects were to produce concrete results that could be disseminated for wider use. The question of utilizing network-based development was brought to the fore upon the initiation of

the programme TYKE in 1996. The network projects were supposed to develop methods and organisational models with the potential for wider dissemination. With the launch of the TYKES programme in 2004, network-based development was continued with the goal of strengthening the programme's generative results, that is, results that indicate how successful the programme is in turning new workplace practices and development methods, and the models and tools created and tested within projects, into sources of learning and inspiration for other companies and stakeholder groups.

Underlying philosophy

The underlying thought in the TYKES programme was that growth-oriented SMEs have a weaker possibility of competing in skilled labour compared with the case of bigger enterprises. SMEs were also assumed not to have similar financial or expert resources available for the development of modes of operation. The threshold for SMEs to actively participate in workplace development programmes and acquire through them external expertise in support of their development could therefore be lowered remarkably with the help of networks. In the case of Liideri, choosing growth-oriented SMEs as the primary focus group derived from the strategy of Tekes. According to their strategy "*Tekes' main target group will be SMEs seeking growth in internationalisation. Moderate growth enterprises play nearly as vital a role as fast-growth ones in boosting the national economy. This is why their high-risk, growth- oriented development projects will remain a significant funding target*".

Geographical scope and set-up

Geographical scope

The geographical scope for both programmes was/is Finland.

Set-up of programme

The TYKES programme had a management team that was responsible for the progress of the programme along the policy lines that were prepared in 2003. The management team had an expert group that functioned as its preparatory body and that handled the project applications the programme received. The practical implementation of the programme was then the responsibility of a project team within Tekes. In addition, the programme had an advisory scientific expert forum and a regional network of contact people in all the Employment and Economic Development Centres and in the occupational safety districts. The programme's main forms of activity were to support project activities, to disseminate information that supports the development of work organisations as well as to strengthen the expertise related to workplace development. The programme's project activities covered workplace development projects and the preparatory basic analyses for them, method development projects, and learning network projects.

The project team interacted mainly with the applicants—that is, the companies and the work organisations, not with the consultants or researchers in development projects. In practice, however, consultants and researchers were very active on many occasions in the projects and took care of many administrative duties on behalf of the workplaces. In TYKES, the project team worked full-time for the programme, but in Tekes from March

2008 the TYKES team members had to start working for other Tekes activities as well (the norm in Tekes). This meant that the work input was reduced considerably.

The main stakeholders in the TYKES development projects were ‘experts’ such as consultants and working-life researchers and bridging organisations such as research institutes and labour market organisations (labour market organisations’ role, however, was modest). In the case of method development projects the primary stakeholders were researchers and research institutes. While the project team was co-ordinating and developing the programme, the ‘experts’, along with the bridge organisations and partly the companies themselves (it was a requirement to get funding), were diffusing the ideas on new management practices.

The learning networks had very different aims and working methods. The project form was intended to be experimental; that is, the programme did not seek to set stringent criteria for the networks on their structure, number of participants, working methods, and so forth. Researchers mainly led the learning networks.

Design of sub-processes

The programme aimed to expand as a kind of national movement, and therefore the aim was to try to access a great number of workplaces. However, no sub-processes or methods were developed to be used in different critical steps such as to ‘train the trainer’,’ engage the customer’, and so forth. In the case of ‘train the trainer’, for example, the companies themselves chose the consultants or researchers. The project team asked for CVs and other related information on their expertise as part of the project application. The programme had certain principles as to what was required of the experts to be eligible for programme funding. The programme did not provide the consultants or researchers any training. The process of engaging customers was in the hands of consultants, researchers and bridge organisations. The process of deploying and developing management practices at the client’s site was the responsibility of management, experts working in the project, and other project participants.

As a whole, channels used by the projects in diffusing the results varied. They included Websites, training, seminars, participation in fairs and conferences, printed and electronic publications, press releases, workshops at the target organisations, and articles in scientific and non-scientific publications. A number of possibilities for interaction were offered such as seminars, events, and network projects. New forums to facilitate interaction were created, such as learning networks and scientific expert forums. These were praised in the interest groups’ evaluations; still, the overall result regarding dissemination of results was perceived as too low (see result above). A more detailed description of the process will now be given.

After receiving the application, a group of two or three people in the project team processed it to a decision stage. The project team held a meeting and decided whether to fund or not. An expert group, consisting of representatives from the labour market organisation, received information on the proposals, and they had a certain time to react and provide feedback. For example, they could ask for more detailed reasons for the

decision and discuss the application in the meeting with the expert group. This, however, rarely happened. The funding for the project was then split into three parts, of which at least a third of the funding was granted after the project ended and all necessary information and documentation was provided to the project team.

The difference in funding between the two programmes was that there is no centralised decision making regarding funding in the Liideri project. The Liideri programme is co-ordinated by the competence area 'workplace innovation and development' in Tekes. Industrial branch units (decisions on funding are made in weekly meetings held by nine different industrial branches) and the regional offices of Tekes will disseminate information on the programme to companies, activate companies on development themes that are within the scope of the programme and provide companies advice on the preparation of project applications. Consultants and researchers work in projects supporting companies, just as in earlier programmes. In addition to development projects in companies, the programme will carry out three research calls during six years. The launch of the programme was preceded by a preparatory stage that lasted more than six months and included, for example, interviews with companies, expert workshops, several meetings and international benchmarking. A model of future-oriented impact assessment is included in the programme to promote programme and policy learning. Moreover, several action groups, consisting of experts with diverse backgrounds, will be established to promote continuous development of the programme.

The maximum grant per workplace within the framework of this programme was €100,000. The funding focused primarily on the use of outside experts such as consultants or researchers (approximately 20%-50% of the total costs of the project). The company took 50%-80% of the total cost, partly in the form of work input. Each company was required to keep a project book in which the development costs of the project were checked by the project team. The target budget for Liideri is the same amount, €75 million. The Liideri programme funds 35%–50% of the total costs of the project as a general rule, depending on the nature of the project.

In the TYKES programme, the development projects for companies started on the initiative of the workplaces themselves, and the projects should be implemented in close cooperation between management and personnel. The minimal requirement for co-operation is that management and personnel jointly deal with the project's implementtation plan and commit themselves to co-operation in implementing it and that a group representing the above parties is established to monitor project implementation. In more than 60% of the cases, the experts working on the projects were private consultants. Most of them were self-employed or worked in small indigenous consulting houses. The share of researchers from universities or governmental research institutes working in the projects was about 20%. In addition, experts from lower-level educational institutes were working in the projects. The division of work between consultants and researchers is not so clear-cut in Finland as in many other industrialised countries and, in fact, consultants and researchers worked in cooperation on many of the same projects. The TYKES programme funded large projects, lasting typically from one to three years,

which were intended to pave the way for long-term development cooperation between management and personnel. The programme left a great deal of leeway to workplaces to set project goals and implement them. The methods used in the projects varied widely, depending on the goals of the projects and the expertise of the consultants and researchers participating in the projects. Typical methods included, for example, surveys, interviews, evaluations, process flow analyses, coaching, team training, process consulting, action research, and establishment of development groups.

Metrics

The management team for the whole programme set the goals, divided into four levels, of the TYKES programme. The goals were set on a workplace level (how can the projects help reinforce a mode of operation that supports qualitatively sustainable productivity growth in the participating workplaces?), a generative level (how can the project results act as a source of learning and inspiration for other workplaces and the various stakeholder groups?), a programme level (how can the programme and its measures promote qualitatively sustainable productivity growth in Finland and develop an innovation environment that supports it?), and finally on a public policy level (qualitatively sustainable productivity growth in Finland).

Results and input targets were set for the different levels as well as for other indicators, which were monitored by the management team at regular intervals. An interim report and a final report contained a detailed account of the progress of the programme in relation to the targets set for each level. The effects of the project were evaluated in these reports, survey questionnaires produced by the programme as well as investigations carried out by external evaluators (Alasoini et al. 2005; Alasoini et al. 2011; Alasoini 2012; and Alasoini et al. 2012). Information on the effects of the development projects was gathered using three questionnaires: a self-evaluation questionnaire, a questionnaire on participating workplaces' modes of operation, and a small companies' questionnaire targeted at companies employing fewer than ten people. According to the self-evaluation survey, the project succeeded quite well. More than 80% of the respondents said that the project succeeded very well in realising its aims, using its experts, and applying its methods. Around three out of four representatives from management reported that the project also had a positive effect on labour productivity. However, while the employees recognised the new practices, it was unclear if these were developed as a result of the TYKES project. In the evaluation of the method development projects and the learning network projects, the main emphasis was on external evaluation.

Effects

The total realised budget for the TYKES programme was €75 million. Project funding of €57 million was allocated to development projects in companies and other workplaces (996 projects, covering more than 3,000 workplaces), €10.4 million to method development projects (25), and €7.6 million to learning network projects (16). The 16 learning network projects involved participation of 35 researchers working on their doctorates, of which 15 had completed their work by the end of 2010, that is, during the

TYKES programme. Further, the researchers and members of the programme team attended dozens of international conferences, in Finland and abroad.

However, the programme did not succeed as expected in producing platforms for the dissemination and distribution of expertise (which was one goal). Only a few of the people involved in the development projects said that they had learned from other companies included in the project or benefited from the events that were part of the TYKES programme.

Further, regarding the overall effectiveness of the TYKES development projects, the conclusion was that the evaluation of the programme did not permit conclusions that the differences that were found between the entry and exit surveys were a result of the TYKES development project that was carried out in the workplace. The reason was that most workplaces that participated in the programme had carried out other projects at the same time. Another major limitation in the programme was the lack of information on the sustainability of the changes achieved in the projects.

Lessons learned

One lesson learned from the TYKES programme and the other preceding programmes was that the dissemination of development methods among researchers and consultants has been more successful than the dissemination of organisational innovations to and among companies. One consequence of this was that during the course of the TYKES programme, there were discussions about whether there should be more formal criteria for the experts. However, this never did lead to setting up any more formal requirements. The lesson learned is also that more packaging of results should have been done.

Further, the aim of trying to access a great number of workplaces was not the most optimal strategy; a more focused approach could have been more efficient in disseminating the results of projects. The experience also showed that simultaneous and sustainable improvement in productivity and the quality of working life requires broad-based participation of employees and a genuine dialogue between management and employees. The commitment of management was highlighted especially in projects where management changed in the middle of the project. In addition to commitment, the skills of the consultant leading the project were viewed as crucial, as was the project timetable.

The participation by both the employer and employee sides in government-supported workplace development at both the programme and project level significantly increased the effectiveness of measures taken. The active presence of labour market organisations in working-life research and development activities is therefore an important precondition for the effectiveness and credibility of these activities.

The majority perceived the learning networks as successful. In the cases where projects were strongly driven by researchers, however, the focus became the progress of the participating researchers' doctorates, while the support for the workplaces' learning processes took a minor role, so activating the workplace representatives became more

challenging. The evaluation of learning networks also indicated that the workplaces' engagement with the projects was made more challenging by the inability to translate the concepts and operating methods of the learning network into more practically oriented language. The learning network model was shown to be a significant creator of generative processes and in some cases also played a role in disseminating awareness of workplace development activities on national, regional, and local levels. The learning networks were considered a social innovation.

The empirical analysis indicates that the development projects have been more successful in bringing about improvements in supporting practices, such as personnel competence development and the role of supervisors, than in the organisation of work as such. This observation may reflect the fact that changes in the organisation of work are often slow, complex social processes, requiring plenty of time and changes in many supporting practices to take place first. Therefore, to make affirmative conclusions on the supporting role of programmes in bringing about changes in work organisation would require a sufficiently long time span. This is seldom the case in programme evaluation studies, however. This applies also to the TYKES programme, in which the questionnaire was usually sent to the respondents within three months after the project had ended.

The survey also demonstrates that the success of the projects has been most modest concerning employment relations and the state of development cooperation between management and personnel in the workplace, especially from the perspective of personnel representatives. The statements used in the survey focus on matters that are probably deeply rooted in their values- and culture-based assumptions on management behaviour. It may even be unrealistic to assume that an individual development project would bring about a radical break in matters like these.

Finally, good practices identified in the development projects were:

- Broad-based cooperation between interest groups
- The scientific expert forum
- Light, flexible, and interactive project application and management
- A multifaceted project evaluation system
- Learning networks
- Strong emphasis on dissemination of information
- A variety of programme services for the project application and expert organisations

The method development projects proved to be a practical way of conducting research that benefits companies and workplaces. The method development and the requirement of dissemination set a concrete aim for the project. The results of the projects included packages of methods and tools, measures and guidebooks for management, employees, consultants, and so forth. The intention was to make the tool kits simple and concrete, suitable for independent adoption by work organisations. To support the adoption of new tools and ways of operation, training concepts were also developed. The tools are used mainly on the Internet. As was mentioned above, methods and tools were expected

to be accessible in some form in order to be used by different experts and firms. One lesson learned, though, was that these matters were difficult for the programme to supervise comprehensively.

Regarding the learning network, many emphasised the flexibility of the project form, which made it possible to react to participants' unclear, hidden, or changing needs. Because the networks had different aims and working methods, however, it was difficult to make generalisations on their results and effects. In addition, networks that were separated from each other used little cooperation or benchmarking. Further, the project model that was used in the TYKES programme for learning networks evolved from a traditional, meticulously planned model towards more process-like, continuously developing networked cooperation (the programme and network co-ordinators initially agreed on the project's total funding and duration and then reviewed and updated the project plan and budget every one-to-two years). Further lessons learned were that the operational model of the learning networks seems to be a good way of creating generative processes and that it is much easier to promote further development of co-operation between players with existing, interactive links than to establish totally new networks.

Regarding goal setting, it was difficult to assess some of the aims set by the TYKES programme because some aims were related to the more general development of working life and the improvement of cooperation between different parties. Finally, in regards to facilitating interaction and therefore dissemination of results, lessons learned were that this requires active networking and arrangement of events realised by the programme as well as the investment of the learning networks' co-ordinators in each learning network project.

Next step

The recommendations based on the evaluation of the TYKES programme were the following:

- Continuation of the programmatic development measures of working life
- A more specific definition of the content and role of developing working life
- Attention paid to the special challenges of the service sector for developing working life
- A closer involvement of strategic, human resource management research and development as a part of innovation research
- The utilisation, in programmatic activity, of the various developing, active, and functional networks of developing working life
- The utilisation of employees' innovative potential and the involvement of employees in innovation activity should be adopted as a viewpoint on the development of innovations in working life
- Tekes should integrate the structures and operational models of dissemination as a part of the research projects and method-developing projects
- Tekes should make use of the active commitment of the social partners in the labour market to developing working life

- Tekes could make use of the good follow-up and marketing methods of the TYKES programme more widely in developing its programmatic activity
- Tekes should make use of the active expert organisations of developing working life in the dissemination of the results and the activation of the development of working life

In 2012, the Liideri programme was launched and a first evaluation of this programme will be conducted in 2014.

Researchers' reflections

The TYKES and Liideri programmes are an interesting example of a trajectory where the design of Liideri is based on the experiences of TYKES, and both programmes show a very similar set-up with a strong labour union presence in the advisory board. The major difference is that Liideri's focus is on innovation and improved work life quality, whereas TYKES focussed on productivity development and improved work life quality. The strong labour union presence is not common in other programmes except in the other Nordic programme, the Production Leap.

Among the programmes compared, TYKES and Liideri are the only programmes directly managed by a government organisation. The approach was not to diffuse an existing organisational innovation; rather, the approach was large-scale experimentation in order to create new organisational innovations for solving a certain problem. Each participating company was empowered to find its own solutions to a problem in Finnish work life, which in theory could lead to the development of several competing solutions that could form a portfolio of solutions to be diffused to other organisations in Finland. However, the target group was perceived as too broad in the TYKES programme, and both experiments and results have been difficult to compare; there are no benchmarks, which means that the programmes lost part of their potential advantage. This calls for the need to narrow down the end-client group and standardise the experiment process and link it to learning networks.

TYKES and Liideri use goals on four different levels, from general to micro level. The metrics used included measurement by surveying the perception of effects, for example, whether or not the project had increased motivation among the employees. As commented upon in connection to other cases, this kind of data is extremely difficult to rely on when it comes to evaluating the impact of a programme. The goal fulfilment of increased productivity was also very hard to analyse because the TYKES project was typically only one among several projects in the companies concerned, and hence it was hard to distinguish the effect of the TYKES project in comparison to the effect of parallel activities.

Each TYKES/Liideri industry project has had more public funding than the other programmes used for comparison, although comparatively less money than the university part. The methodology development projects with doctoral students and university researchers were also well financed (€10.4 million 25 projects) and had limited contacts with industry. In addition, the 16 learning networks were well financed

(€7.6 million) and were the most expensive component of the programme. In the world of innovation, the need for experimentation is commonly talked about, but with low cost probes. Perhaps the lessons learned from TYKES, for example, could have been learned in a more efficient way, possibly with a narrower target group or with a higher degree of standardization of 'object' and processes in order to allow comparisons and learning.

4.6 The Stage-Gate® process

Summary

External triggers behind the Stage-Gate® process were a demand for decreased time-to-market in light of the fast growth of Japanese competitors in the North American market and stagflation in the Western world that made the effective use of corporate resources important. In this context, Robert G. Cooper and his book on the need for a more systematic approach to product development started the movement behind Stage-Gate®. The concept was trademarked and the intellectual property rights are owned by Dr. Cooper's company, the Product Development Institute (PDI). The Stage-Gate® process is a conceptual and operational road map for moving a new-product project from idea to launch. Over the years, the concept has been complemented by others such as, Portfolio Management for New Product Development, Product Innovation and Technology Strategy, and Culture and Leadership for Product Innovation. These four concepts are today part of the Innovation Diamond™ framework, also developed and trademarked by PDI.

Important for the dissemination of the concept was the adoption by large corporations, who tested and further developed the concept, together with the PDI. After the first wave of large corporations had tested and developed the concept, a second wave of large corporations adopted the concept and developed it further. After some time, due to the adoption by these large corporations, other important stakeholders such as other companies, consultants and researchers accepted Stage-Gate® as a good way forward in product development. The dissemination process is therefore characterised by observed benefits, a standardised organisational innovation on new product development, credibility and trust due to large role models adopting the concept and a close trial and learn process between the provider of the concept (PDI) and users during the first years.

The support structure behind the programme has over the years developed into three main parts: the PDI that conducts research and packages the products and services; the more commercial arm, Stage-Gate® International, that sells, markets and provides products, services, and knowledge (in the form of articles, videos, and a knowledge community service); and certified software partners. The certification of software partners is a standardised three-step process and makes it possible, for the partner to use a Stage-Gate® Ready Certification logo on their products and home page. The mechanisms for diffusions are among others: the two founders, Cooper and Edgett (lecturing, research papers, books); Stage-Gate® International and its sales, marketing, and consultancy activities, together with its online platform; the third partners through

their software; user network in the form of multinational corporations that act as role models; and other researchers who write and talk about the Stage-Gate® process.

Metrics to meet achieved goals is an area in which PDI conducts research. However, they do not require any specific metrics to be used by the client or any post-launch follow up. An important lesson learned from this programme is that PDI has noticed that firms that adopt the Stage-Gate® process commonly do not stop there, but continue to tailor it, scale it, and fine-tune it according to the firm's needs. They have also complemented the initial Stage-Gate® process with other organisational innovations such as agile product development, lean principles, and open innovation. PDI conducts research on successful product development cases and has therefore created new improved (next generation) versions of the concept.

Background and purpose

In the late 1970s and early 1980s Dr. Cooper, a professor of Industrial Marketing at McMaster University's Business School in Hamilton, Ontario, Canada, conducted extensive academic research in the field of new product development. His research was published in journals such as Research Technology Management, and he was hired as an advisor to large corporations such as Dow Chemical, DuPont, and Procter & Gamble. In 1986, Dr. Cooper published his book 'Winning at New Products: Creating Value through Innovation' (4th edition in 2011). This book was translated into Mandarin and German. Dr. Cooper became known in the field of new product development and became an early president of the Product Development & Management Association. Over the years he has published more than 100 articles and won several awards such as the Maurice Holland Award from the IRI (Industrial Research Institute, Washington) and the Lee Rivers Award from the Commercial Development & Marketing Association (U.S.).

In mid 1980s, Dr. Cooper, together with Dr. Scott J. Edgett, founded the 'Product Development Institute', which owned all intellectual property rights of the Stage-Gate® process and later also of the Innovation Diamond™ (explained later in the case). The concept was at this time trademarked and became a strong brand over time in the area of product development. The Stage-Gate® process has been adopted since the mid-1980s by large corporations that either acted as early adopters or had looked at their competitors and then wanted to adopt the concept.

The primary purpose of the concept was to introduce a 'systematic approach' to product innovation, something that, according to Dr. Cooper, had not existed before the Stage-Gate® process was introduced. The Product Development Institute has since 1986 further developed the systematic approach. Dr. Cooper and Dr. Edgett introduced the Innovation Diamond™ framework in a book in 2005.

Uniqueness

The initial uniqueness of the concept was a more systematic approach to product innovation based on 60 case studies on efficient product innovation processes. The case studies originated from the first half of the 1980s when, for North American industry,

time-to-market was the competitive challenge in light of the fast growth of Japanese competitors on the North American market. Furthermore, at the time the Western world faced stagflation, making the effective use of corporate resources very important.

Identified results

According to Stage-Gate® International, the adoption rate has continuously increased over the years and has gone from a few cases in 1986 to 44% of North American companies in 1995, 68% of North American companies in 2000, and 73% of North American companies in 2005. Today, according to Stage-Gate® International, which refers to a number of independent research studies such as Product Development & Management Association, AMR Research, and Booz-Allen Hamilton, the adoption rate is between 70%-85% of leading U.S. companies. Further, according to a more recent study (the Booz-Allen's Global Innovation 1000 reports), also referred to by Stage-Gate® International, it is estimated that all of the Fortune 1000 companies use some form of a stage-and-gate process to develop new products. However it is important to remember that it is not clear how Booz-Allen Hamilton has defined "*some form of a stage-gate process*". For a list of clients see, http://www.prod-dev.com/clients.php

Object and theoretical background

Object

The Stage-Gate® process is a conceptual and operational road map for moving a new-product project from idea to launch. The concept divides the effort into distinct stages separated by management decision gates (gatekeeping). Cross-functional teams must successfully complete a prescribed set of related cross-functional activities in each stage prior to obtaining management approval to proceed to the next stage of product development.

Product innovation begins with an idea and ends with the successful launch of a new product. The steps between these points can be viewed as a dynamic process. The concept divides this process into a series of activities (stages) and decision points (gates). Stages are where the action occurs. The players on the project team undertake key activities to gather information needed to advance the project to the next gate or decision point. Stages are cross- functional (there is no research and development or marketing stage), and each activity is undertaken in parallel to enhance speed to market. To manage risk, the parallel activities in a certain stage must be designed to gather vital information—technical, market, financial, operations—in order to drive down the technical and business risks. Each stage costs more than the preceding one, resulting in incremental commitments. As uncertainties decrease, expenditures are allowed to rise and risk is managed. Preceding each stage is a decision point or gate, which serves as a Go/Kill and prioritization decision point. Gates are where mediocre projects are culled out and resources are allocated to the best projects. Gates deal with three quality issues: quality of execution, business rationale, and quality of the action plan.

In addition to the Stage-Gate® process, a number of critical success factors have been identified and documented as part of the process. For example, there are 15 critical

success factors identified for new product success and ten critical success factors identified for implementing the concept.

The Stage-Gate® process is, however, only one concept out of four provided. The process was the initial part of a more systematic approach to product development. In 1995, Portfolio Management for New Product Development was introduced, and in 2000, Product Innovation and Technology Strategy Framework were introduced. Later also a fourth part was added, Culture and Leadership for Product Innovation. The four parts are today all components of the Innovation Diamond™ (Cooper, 2011a) which, similar to Stage-Gate®, is trademarked by the Product Development Institute. However, the overall corporate brand for all four different offerings is Stage-Gate® because of the strength of the brand. Stage-Gate® International therefore provides both products and services around the four cornerstones of the Innovation Diamond™. The products, which are more tangible, standardised, and coded knowledge are SG navigator™ (a user-friendly Web interface that gives the company access to a collection of idea-to-launch practices, proprietary methods, criteria, deliverables, templates, and instructtions); Benchmarker (to compare an organisation's innovation performance and practices against the best. It is a cost-effective assessment that isolates strengths and weaknesses against proven performance drivers); Innovation seminars (five to eight per year, led by Dr. Cooper, in the United States); and Publications on product development. The services are primarily consultancy services focussed on issues such as Innovation Performance Assessment (evaluating the current state of a company's product innovation programme to target performance improvement); Product Innovation & Technology Strategy (focussing on innovation efforts and investments to support business goals); Portfolio Management (building a high-value portfolio aligned with strategy); Stage-Gate® Idea-to-Launch Systems (accelerating new ideas and technologies from inception to launch with improved success); and Training and Development Solutions (developing an organisational capability in product innovation).

In addition to products and services, Stage-Gate® International provides Knowledge in the four areas—The Innovation Diamond™, Product Innovation and Technology Strategy, Stage-Gate® Process, and New Product Portfolio Management—by sharing articles and videos on the four topics. Finally, the company provides a 'knowledge community' service, through which the subscriber receives the latest research and tips in product innovation and also news about seminars and events.

Theoretical background

The theoretical background is primarily Dr. Robert Cooper's and Dr. Scott Edgett's own research. Dr. Cooper has, according to Stage-Gate® International, spent more than 30 years studying the practices and pitfalls of 3,000-plus new product projects in thousands of companies and has conducted research on the topic. He has published more than 100 academic articles and seven books. Dr. Edgett, also a former professor at McMaster University, Ontario, Canada, has conducted research and consultancy in portfolio management for product innovation and on issues affecting innovation leadership and capability. He has co-authored eight books and has published more than 60 academic articles. In addition to their own research, they have been influenced by

concepts such as lean manufacturing and agile product development, for example, and have integrated components of these concepts into their own.

Target group(s) and underlying philosophy

Target group

Any company of any size across all industries could use the Stage-Gate® process. The target contact person within each company differs depending on which concept is desired. For example, CEOs or senior executives could be the target group when a product innovation and technology strategy is to be defined. If the service is the Stage-Gate® Idea-to-Launch system, the target contact person could be the process manager, project leaders, and people working in product development.

Underlying philosophy

The underlying philosophy behind the concept is to help companies achieve successful product innovation and launch the most profitable new products to market quickly and efficiently.

Geographical scope and set-up

Geographical scope

The primary geographical scope is North America. There is a representative for Europe, however, who is based in Europe.

Set-up of programme

According to Dr. Cooper himself, the dissemination of the concept is explained through a number of important steps during the first years (Cooper, 2012). The first important step was, he says, the publication of his first book, in which he presented research on successful product development and the commonalities he found among the successful cases. In the last chapter of this book he stated that there is a need for a system for moving new products to market, which was the predecessor to the Stage-Gate® process. The second step was that three large corporations (DuPont, Nortel Networks, United Aircraft) decided to try a more systematic approach, and in this step, the Stage-Gate® process was initially designed. The third important step was when a number of other credible and large corporations (e.g., P&G, DuPont, Emerson Electric) adopted the concept. Finally, the fourth step was when researchers, consultants and firms that benchmarked companies and their product development processes figured out that the Stage-Gate® process was the way to go in product development.

Three major parts build the formal set-up behind the Stage-Gate® system. First, the Product Development Institute conducts research on companies that either have or have not adopted the concept but have proved to have an efficient and effective product development. The findings are then packaged and trademarked as concepts. Second, Stage-Gate® International could be viewed as the commercial arm that sells and provides the products, services, and knowledge in form of articles and videos and also manages the knowledge community. Third, certified partners, primarily software application providers, support and enable the Stage-Gate® processes. The partners are carefully selected through a Stage-Gate® Ready Certification, which differentiates

software automation solutions that have passed some 200 innovation-related criteria. The seal of approval assures potential buyers of product innovation software that the solution performs the functionality necessary to successfully implement Stage-Gate® best-practice processes such as Idea Management, the Idea-to-Launch process, and portfolio management (each area is fulfilled by using software from certified vendors). The certification is conducted in three steps: a software solution evaluation (vendors submit their software solution to an evaluation conducted by a Stage-Gate® Innovation expert); a software solution validation (the vendor submits proof of installation in a client's production environment and installation is validated by a Stage-Gate® product innovation expert); and a re-certification process (the vendor demonstrates ongoing achievement of all mandatory criteria through a re-certification evaluation process that occurs every two years). Stage-Gate® Ready vendors can display a Stage-Gate® Ready logo on their product, on their Website and in their promotional material. Currently there are seven U.S. certified partners/vendors, because either Stage-Gate® International reached out to them or they contacted Stage-Gate® International. These are: Innovation Framework Technologies, Sopheon, CA Clarity, the GenSight group, Planisware, Planview and Powersteering. Through these seven partners, Stage-Gate® International reaches some markets outside of North America.

Design of sub-processes

The movement around the Stage-Gate® process was initiated in 1986. However, the volume of consultants did not dramatically increase before Stage-Gate® International was founded. The dissemination of the products, services, and knowledge is therefore conducted by their own consultants and through software through certified partners and their sales channels, complemented by online channels. The work to 'train the trainer' is therefore focussed not on other consultants, but on software vendors through the certification process, which is handled by Stage-Gate® experts employed by Stage-Gate® International.

The process of 'engaging the customer', is conducted partly through corporate marketing, focussed on building awareness about the concept, complemented by their own limited sales force and third parties that provide their own software.

Stage-Gate® International consultants and/or articles on how to effectively deploy the Stage-Gate® process support the deployment of the solution. According to one article (Huskins, 2012), the company must push on and master two critical steps in the deployment, designing and then implementing a high-quality Stage-Gate® process. In the phase of designing the process, five ways to communicate it more effectively were emphasised: make it visual, tell a story, make it accessible, make it valuable, and confirm expectations. According to their own experience, the first 90 days of the Idea-to-Launch process design and implementation are critical to determine whether or not it will succeed. During these 90 days the company needs the right combination of expertise, advice, facilitation, and education to succeed. Once the process is designed and implemented, companies are expected to constantly fine-tune their process to ensure it is running at optimal capacity and is driving the results that their organisation is targeting. Once they have fine-tuned the process, they may look at the next-generation

facets of Stage-Gate®. This next generation is also developed by the Product Development Institute and includes seven elements that integrate parts of Lean and Agile development thinking into the Stage-Gate® process.

Finally, in order to sustain the solution, Stage-Gate® International provides 'mechanisms to continuously improve and refine the process and make it perform better' through seminars and events and by the company subscribing to a knowledge community.

Metrics

A study conducted by the Product Development Institute and American Productivity & Quality Center (APQC) on 211 businesses was focused on performance metrics and practices. In this study (Cooper & Edgett, 2012) the best-performing businesses were identified from an analysis of three performance metrics, overall new-product productivity, and the degree to which new products met sales and profit objectives. The practices associated with these best-performing businesses were identified as best practices, and their impact on performance was quantified. There were problems identified with the two last metrics, however, as they could motivate the wrong behaviour and do not reflect the true value of the new-product activity. One solution to this problem was that some companies measured 'net sales value' of new products instead, that is, the increase in sales as a result of the new product. There was also a problem with the last two metrics because they vary across industries. Dr. Cooper and Dr. Edgett present in this article some other, alternative metrics that could be used. They state that there are two key indicators: the overall profitability of the business's total new product effort relative to R&D spending and the business's overall performance against sales or profit objectives for new-product development over the last three years.

However, they gave no information on how they measure firm or eco-system impact as a result of implementing the Stage-Gate® process. Referring to a research paper in APQC, however, they claim that companies that use a Stage-Gate® process end up as the best performers in product innovation.

Effects

One metric for measuring the dissemination of the concept in North America is market penetration (e.g., number of Fortune 1000 companies that use a stage-gate process). However, as indicated above, it is hard to evaluate if all these companies have adopted the Stage-Gate® process fully or only parts of it, or have adopted some other similar process. Stage-Gate® International indicated this dilemma because they claim that it isn't as high as70%–85 % of companies in North America that have adopted a "*completely effective Stage-Gate® process"*. Regarding firm impact, there is a post-launch review conducted one or several times by the company itself 6 to 18 months after launch. The post-launch reviews assess if the company was successful with the new product, if the project team that launched the new product was effective, and if the process used was effective as an enabler to launch new products. This feedback mechanism provides firms with the ability to assess their own innovation programmes

and identify areas to fine-tune and improve. The concept empowers companies with the tools and the knowledge on how to do post-launch reviews, but actually doing a post-launch review is up to the company. Stage-Gate® International therefore does not formally require taking part in the result of the review. But they do claim that long-term relationships with their clients make it natural to share lessons learned.

Lessons learned

Stage-Gate® International has numerous findings on the lessons learned over the years. According to them, firms have found ways to evolve and accelerate their Stage-Gate® idea-to-launch systems. They have found ways to make their systems scalable to suit different risk levels, sizes, and types of development projects; they have made their systems adaptable in order to accelerate the process (spiral or agile development, concurrent activities, overlapping stages, and conditional Go decisions); they have also introduced lean manufacturing principles in order to remove waste and bureaucracy from their idea-to-launch systems; they have made continuous improvements in their process and projects (using post-launch reviews); they have accommodated 'open innovation'; they have integrated Stage-Gate® process with the total life-cycle management model (from product creation to product exit); and they have automated the Stage-Gate® process.

Next step

Not disclosed.

Researchers' reflections

Stage-Gate® is not a programme funded by public means; rather, it is an example of the dissemination of an organisational innovation through a process that is self-sustained—that is, there are no public means that are directly linked to it. Instead, for this concept the primary diffusion mechanisms are well-known books, research papers, conferences (lectures), role models in form of large corporations, marketing and sales activities conducted by Stage-Gate® International, and Stage-Gate®-approved software sold by third parties. The focus on large company consultancy and the publication of empirical studies in large companies seems to be a major contributor to the diffusion to most of the Fortune 1000 companies. In addition, the software supplied by a selected number of software providers contributes to a standardised way of approaching the concept, which facilitates diffusion and continuous upgrading of the organisational innovation.

The concept has become more or less standard practice in industry—most companies, except for very small SMEs today use some variant of organising their product development in phases with decision gates. The market is close to saturated and although the trademarked Stage-Gate® process is far from the only approach used it is an example of an extremely successful diffusion of an organisational innovation. Today it could even be viewed as a self-sustaining system with a certain inertia that newer approaches try to break by using, for example, agile development and lean principles. Stage-Gate® International has responded to this threat, however, by integrating parts of agile thinking and lean principles in its more recent version of the Stage-Gate® process.

Finally, it is interesting to reflect on the emphasis on post-launch reviews. In the case of Google (Steiber & Alänge, 2012), there was no formal requirement for any post-mortem activities. Instead this was up to the single team and was driven by the company culture that emphasises continuous learning.

4.7 The Production Leap

Summary

The Production Leap is a major national initiative funded by a group of public funding organisations. The purpose is to improve companies' competitiveness through increased production capability and to develop companies' ability to produce efficiently and with continuous improvements. A first phase started in 2007, a second phase in 2010, and the programme is now in its third phase. The target group is manufacturing companies with 30–250 employees. The philosophy is that large companies create their own change processes but SMEs need to change and cannot do this on their own. The object used to improve efficiency is the well-standardised organisational innovation 'Lean Production'. The Production Leap programme has developed gradually over time, from a focus on tools to a focus on also leadership, culture, and learning.

Awareness seminars, education, contracting, and a standardised deployment process (Wave), are activities for diffusing the 'object' to and internally in a firm. The set-up of the programme consists of stakeholders such as: a programme co-ordinator (Swerea IVF), a co-ordinator for education (Chalmers), and other partner universities such as KTH, LTU, Tekniska Högskolan I Jönköping, Mälardalens Högskola, Mittuniversitetet, Högskolan I Gävle and BTH, and local consultants. There was no goal to train consultants for broader dissemination, but around 30 consultants have received training in the Wave approach and participated in the university course in Lean Production. The governmental budget for the programme was SEK 113 million from 2007 to June 2012, complemented by some funding from the companies themselves (plus their investment in time).

The programme co-ordinator has continuously followed up and evaluated the programme. The evaluations are made in relations to the goals for the programme and are primarily expressed in terms of activities performed by the stakeholders. Metrics have therefore been on activity level, and some have been based on the development of the content and structure of the programme. The impact on the firms has been evaluated through companies' perception.

Lessons learned are that three factors are of extra importance for success: continuity, an improvement culture, and a common work approach. Continuity is important both in funding and in interest by stakeholders. Improvement culture means that each problem creates opportunities to learn and improve, and a common work approach means standardised methods and structure that provide an opportunity to learn. In addition to these three, it was found to be crucial that the leadership assume the responsibility for the programme. Another lessons learned was that the programme in itself developed a more

structured way of interacting, including putting stricter demands on the participating companies' change process.

Background and purpose

The Production Leap is a major government-funded mobilization to diffuse the organisational innovation of Lean Production to SMEs by involving collective research institutes, universities, and consultants as teachers and as coaches for change processes within SMEs.

The purpose is to improve companies' competitiveness through increased production capability and to develop companies' ability to produce efficiently and with continuous improvements. The geographical scope is national, and the ambition has been to include both companies and training/coaching providers from all parts of Sweden.

The sub-goals that reflect the programme's overall design are to create awareness in companies of existing improvement potentials to stimulate them to initiate improvement activities; to initiate practical and long-term improvement work, and to actively support this during the start-up phase; to influence and create insights among customers and suppliers in medium-sized companies of the value of efficient production; and to support companies over the long term in their continued development based on each company's individual needs.

A first phase started in 2007-2009, the programme received new funding for a second phase in 2010-2012, and it is presently in the process of applying for funding for a third phase. Sixty companies were contracted in the first phase, and out of these, 57 fulfilled the 18-month project period. In the second phase, 80 companies participated. A third phase starts in 2013.

Uniqueness

The Production Leap has developed a comprehensive structure and work approach for introducing management innovations in Swedish industry that involve universities, applied research institutes, regional actors, and industry. The focus has been on Lean Production and on enhancing the competitiveness of Swedish medium-sized industry through improved production and continuous improvement activities. However, the Production Leap has increasingly focussed on a change in leadership and company culture, including creating learning mechanisms.

Results

The first phase of the programme was evaluated by a group of researchers (in Swedish: Följeforskare). The programmes own final report for Phase 1 reported large, concrete changes in the companies. It emphasised that a majority of the companies had expressed the view that the main long-term impact of the programme was an expected culture change towards a considerably larger willingness to change and an increased 'shared view' in the companies. The companies who have participated, however, have provided no concrete results (i.e., numbers) in terms of increased productivity, lowered costs, increased profits, and the like. Instead the output of Phase 1 of programme was mea-

sured in terms of the number of companies participating in awareness seminars (2,800), and the number of course participants examined in a 7.5-point university course in Lean Production (340), and the completion rate (57 out 60 contracted firms) in Phase 1 who fulfilled the 18-month change project. In addition, a select number (27) of companies that were visited for a follow-up one-to-two years after the project began expressed effects such as increased productivity (95%), increased quality (83%), and shorter lead time (93%).

Olsson & Hellsmark (2012) presented a quantitative evaluation based on annual reports from 2007 to 2010. All but one key indicator showed at the end of the period a more positive development for the participating companies in comparison with a control group. The indicator showing a negative trend was the number of employees; the participating companies started on a higher average employment level, however, and the Production Leap was not focussed on job creation. During the early period the development was more negative for the participating companies; this trend was turned around, however, towards the end of the period. Profit margins, value added, and solidity showed clear positive trends, whereas the positive trend was weak for turnover, turnover per employee, inventory turnover, annual result, and annual result per employee. The evaluators commented that it is important to be aware of that external changes influence the companies to a considerably larger extent than do the changes made through the Production Leap.

Phase 2 of the programme included a redesign of parts of the programme based on what had been learned during Phase 1. While Phase 1 had a process/production focus, Phase 2 has had more of a leadership perspective and focussed on the total company and its strategies, working with the leadership group or steering committee. The company range has also become broader, from traditional manufacturing towards including, for example, the construction industry.

Object and theoretical background

Object

The Production Leap follows a standardised design with different components providing distinct contributions and with a standardised work approach.

The Production Leap programme starts with Awareness Seminars, which have been given all around Sweden and reached a great many of companies in their leadership, in their labour unions, and among other employees. The intention has been to reach also a broader group of societal actors, including regional associations and local authorities. The ambition has been to convey a picture of the international threats to Swedish industry and to provide examples of successful organisations using a lean approach.

The second component is education, where a 7.5-point university course in Lean Production has been offered in various locations in Sweden. The Production Leap subsidises two ‘change leaders’ to attend this Lean Production course. Change leaders are supposed to work actively with the implementation of Lean Production in their company. They hold various formal positions in their respective companies, for

example, managing director, company labour union chairperson and operator and are expected to become the lean co-ordinator, production technician, and the like. This course meets five times for two days. The participants design an action plan for their own company's Lean Production development as their final project assignment.

The third component, called the Wave, is an 18-month standardised and well-tested process where companies work on introducing Lean Production with the help of both the education component and coaching from the programme. The intention is to gradually develop insights, knowledge, and a driving force for change inside each company.

Before the work starts a formal contract is signed outlining the obligations and expectations from each party. A head coach and an assistant coach are appointed to consult with the company. They conduct workshops, give instruction, and provide coaching to the steering group every other week during the first year, in order to introduce, stimulate, and urge on the introduction of agreed-upon principles, ways of working, and methods.

The process starts by developing awareness in the Steering Committee, which then has to develop its own goals and strategies based on each individual company's strengths and weaknesses. The basic idea is to develop a shared view, which is done by producing an internal booklet on the company's principles. The group's members must put aside time for compulsory follow-up at least every other week, but preferably every week, and for significant work efforts in the meantime. The Steering Committee is typically the company leadership group, including labour union representatives and other representatives from different areas and different levels within the organisation, usually around ten-to-twelve persons.

New methods and tools are introduced at regular intervals. Each participating company has to make the material its own, however. Each module introduced is used by a trained (in a standardised work approach) pilot group, within a well-defined application area. After the establishment of the pilot groups, the company can roll out new groups where required. The Production Leap's coaches and experts make day visits for workshops and coaching every other week during the first ten to twelve months. After that, as the company's own forces acquire the knowledge and take over as the pacemaker, and the interval is lengthened to four weeks. Production Leap reserves 35–44 visit days for the company, depending on the size of the company.

An interesting aspect concerns the programme's learning process—every second week there is a pulse meeting for 45 minutes that includes the educators and the coaches. Because not everyone can be present in the co-ordinator's room, because the consultants /educators are dispersed throughout Sweden, the programme utilises an electronic log to follow up the progress within each company. The log indicates green if everything is on track, yellow if there are some changes, and red if something is urgently needs attention. These pulse meetings have been an excellent way to co-ordinate the programme and also have contributed to learning needed to gradually develop a standardised way of

operating. The programme has other mechanisms for shared learning as well. Twice a year the programme organises two-day reflection meetings; all involved in the Production Leap are invited to participate in the autumn, and the coaches share experiences in the spring. The education organisers also meet occasionally for reflection. In addition, the assistant coaches typically are from the organisation, Swerea IVF, and meet once a month to develop new methodology, which is then diffused to the head coaches, who typically are from the vicinity of the participating companies.

Theoretical background

The starting point was a 2004 IVA report, *"Made in Sweden—Production as Power for Competitiveness"*, which concluded was that Swedish SMEs had a considerable potential for improved productivity. The ambition of the programme was to introduce theories and methodologies of Lean Production according to Toyota Production Systems.

When the programme was started, Lean Production as a concept had been around for almost 20 years (Womack et al., 1990)[1], with an expanding publication of analysis of Toyota's production system over the past 10 years (e.g., Liker, 2004). Although standardised knowledge existed, the views within the Production Leap were not initially consistent because many variants existed in parallel. The Production Leap initially had a tool focus, which gradually has been changed to a system view, leading to an increased focus on culture, leadership, customer value, and continuous improvement.

The Production Leap describes its approach as inspired by Lean Production, but they adapted it and created it based on Swedish culture and approach; for example, Swedes are competent at teamwork and their competence level is relatively high.

The programme strives to integrate values, principles, tools, and results in an on-going iterative process. Based on the earlier experiences of the partners, the programme was designed with a specific focus on the involvement and understanding of leadership and on creating conditions for a long-term improvement process in the participating companies.

Target group(s) and underlying philosophy

Target group

Companies with 30–250 employees (in special cases up to 500) operating in the traditional manufacturing industry make up the target group. The fee for participating companies is SEK 11,000 per month for 18 months, as well as a one-off fee of SEK 500 per employee.

The fee for two people to attend the Lean Production course amounts to SEK 18,000 per person. More than 1,000 persons have been trained.

Underlying philosophy

[1] Researchers from Chalmers contributed to this international study initiated by the Massachusetts Institute of Technology in the United States, although none of these researchers participated when the Production Leap programme was formed 17 years later.

Large companies create their own change processes but medium-sized (or SMEs) also need to change but cannot do this on their own. The Production Leap concentrates on existing medium-sized companies, not on start-ups.

A basic assumption in the Production Leap is that a change process like Lean Production demands a deep involvement from all levels of the participating firms, including the top leadership and even their boards. Hence, there are demands on not only participating change agents and personnel but also for top leadership's active and continual participation in the change process. The Production Leap even demands that the company board makes a formal decision to start the change process.

National labour unions and the employer's federation are part of the founders of the Production Leap programme. The target group includes societal actors on regional level as well as labour union representatives in the participating companies.

Geographical scope and set-up

Geographical scope

The Production Leap is directed towards companies all over Sweden and to reach all regions where the programme has been designed to work with regional partner universities.

Design of programme

Swerea IVF is the programme co-ordinator and co-ordinates the coaching component of the programme. The awareness and the education component are coordinated by Chalmers University of Technology. In addition, university partners include KTH, LTU, Tekniska Högskolan I Jönköping, Mälardalens Högskola, Mittuniversitetet, Högskolan in Gävle, and BTH. Other regional partners are involved such as regional research institutes (IUIs). The advisory partners include the employer's federation, represented by Teknikföretagen, and labour unions, represented by IF Metall.

The total budget for Generation 1 was SEK 71 million, out of which SEK 61 million were financed by the Knowledge Foundation (KK-stiftelsen), VINNOVA, NUTEK, and the Swedish Agency for Economic and Regional Growth (Tillväxtverket). In addition, the participating companies paid SEK 8 million (and reported own work for SEK 161 million). Generation 2 had a total budget of SEK 71.7 million and SEK 4.7 million of these were specifically earmarked for ten companies from the automotive industry. The public funding was in total SEK 52 million. The total public funding for 2007–June 2012 thus was SEK 113 million.

Metrics

The programme committee continuously follows up and evaluates the Production Leap programme (e.g. Öjmertz, 2011, 2012). These evaluations are made in relation to the goals for the programme (Öjmertz, 2009) and are expressed primarily in terms of activities performed by the Production Leap partners. The three main activities are measured in the following ways: Insight/motivation in terms of number of seminars and regions covered; Education in university-accredited Lean Production course – number of courses, geographical dispersion, and number of participants; Coaching in a number

of companies (started, on-going, finished), number of workshops and number of coaching hours, both in total and in each company.

In addition, the programme evaluation comments upon the development of both the programme content and of the national/regional programme structure.

The impact on the participating companies is also of interest but is harder to measure. Follow-up visits have been made to participating companies, where the companies told about what had happened after the project, in relation to customers, co-workers, owners, and society. Although some numbers were used as examples, this kind of evaluation is qualitative and measures the participants' perceptions of impact on their companies. In addition, the coaches' comment upon their view of the development in each participating company, providing examples of what has been changed, of activities, and of difficulties of various kinds – ending with an estimate of what the Lean Production work will lead to at their company. As in all perceptions, the data has a tendency to be skewed towards 'larger than average', with very few 'minor' or 'very minor' – in the sample provided for Phase 2, the 'real average' seems to be somewhere in between 'larger than average' and 'average' improvements. However, the estimates might also reflect experiences gained in the programme and the coaches' estimate might be in relation to the Phase 1 companies' accomplishments.

VINNOVA has commissioned an evaluation of the programme from 2007 to 2010 based on metrics from annual reports until 2011 (Olsson & Hellsmark, 2012). It is hard to conduct an evaluation based on annual report data directly in connection with projects' finalization, however. In the 2011 data it might be possible to discern some results – but there are many factors influencing the annual results for a company.

Effects

Reviewing the Production Leap's three main goals, it is evident that the ambition to arrange seminars all around the country has been a priority in order to create awareness of Lean production. In Phases 1 and 2 of the programme (2007-June 2012), 225 seminars have been arranged with 13,300 participants from more than 3,000 companies and in 86 different locations.

The course in Lean Production has had a total of 1,143 participants from 2007 through June 2012 (during Phase 2 the total has been 565 participants in total, out of which 323 are from the target group. Out of these, 149 were partly financed by the Production Leap programme and the remaining 174 were paid for directly by their companies). A measure of the geographical distribution is that during 2007 through June 2012 the course was given 48 times at 18 different locations all around Sweden and in cooperation with regional actors.

In the Production Leap there is a considerable investment in terms of coaching hours within the framework of the programme. Looking into the number of coaching hours, 25,800 hours were spent during Phase 1, that is, 430 hours on average. For Phase 2, of a total 17,728 hours spent in 75 companies (Öjmerts, 2012 – when the programme was

halfway through the last year), the maximum in one company was 458 hours, and a typical number of hours (for companies that started early in Phase 2 of the programme) was somewhere between 350 and 400 hours.

During Phase 1, 57 out of 60 companies finished the 18-month Production Leap programme. The public investment was SEK 61 million for the total programme, that is, around SEK 1 million per company participating. For Phase 2, the public investment was SEK 52 million, and the goal was to have 80 companies participating, which means around SEK 0.65 million per company. However, the estimate of public investment per company is a crude measurement because the investment also covered the creation of the national structure as well as some costs for companies outside the direct programme that sent personnel for training.

In the Production Leap there has been no goal of training consultants – but right now 25 coaches are active and between five and ten have left the programme, that is, around 30 consultants have achieved some kind of training in a standardised way of working during the time period 2007–2012.

Lessons learned

Learning has taken place inside the Production Leap programme, which has influenced both its content and its learning approach. Stenvall et al. (2011) summarise what was learned from the first generation of the programme (2007-2009) and how it affected the design of the second generation (2010-2012).

According to the programme director of the Production Leap, there are three decisive factors for success: continuity, an improvement culture, and a common work approach. Continuity is of importance both in funding from the financing organisation and in the interest of stakeholders, partners, and doers. Improvement culture means that each problem creates opportunities for learning and improvement – and this includes as well the work approach within the Production Leap. Finally, the common work approach with standardised methods and structure provides a value and learning opportunities for many participants.

However, the most important factor for success in a company is the leadership; they themselves must assume the responsibility and not delegate it to someone else. It is important that everyone strives in the same direction, including both the managing director and the labour union. The labour union is involved early and gets its assignment for its contribution to the process.

The Production Leap approach has been developed gradually, and today there is more structure and more pressure on the participating companies to follow the process. The coaches are returning every second week to make sure that the process is evolving at the company, including making the process more clear for the steering groups. However, there is a variation among coaches; some are more demanding whereas others are more likely to just listen.

Additional learning takes place when the company projects provide effects not only on the participating companies but also beyond what the companies are recording.

Next step

The Production Leap is now starting its third programme period.

Researchers' reflections

The Production Leap seems to have had an impact both on the participating companies and other stakeholders through awareness seminars and through the university course directed towards both internal change agents in the companies and the participating coaches. Through the upgrading of consultants and by involving regional actors from universities in the process, the programme functions as a national mobilisation. Although the university course is open to other participants, however, the programme was not designed to scale through a systematic, efficient upgrading of consultants in a similar way as some of the other programmes have. This would be easy to accomplish, however, in order to increase the impact beyond the direct client companies.

The Production Leap has gradually changed its focus from the tools and methodology of Lean Production to areas of more general concern for company development, such as leadership, culture, and learning. Hence, the question is whether the present set-up for an inter-firm diffusion could function as a framework also for the dissemination of other organisational innovations, such as Innovation Management, and whether this basic set-up would be cost-efficient given the modifications and upgrading of knowledge that would be necessary. In regards to intra-firm diffusion, the Production Leap team themselves thought that the Wave approach developed in the programme is reproducible and also could be used for the implementation of other organisational innovations.

The public investment per company in the Production Leap is relatively high. The only programme with a similar amount of public investment per company seems to be TYKES/Liideri, whereas other programmes such as the GrowthAccelerator, CENTRIM, and Innovation Engineering System operate with a considerably lower amount of public investment. However, it comes back to the purpose of the programme; it is not possible to directly comment on the cost in a comparative perspective without looking a bit more closely into the purpose and the demands on design that follow.

5 Discussion

5.1 Introduction

In this chapter, findings from the seven case descriptions will be the subject of a comparative analysis. However, the chapter starts with a discussion of these programmes as a path-dependent learning process. This is followed by an examination of a number of factors that might have important consequences for both programme designs and outcomes, and hence, also affect the comparability of the programmes. The chapter then continues with an analysis of similarities and differences between the programmes, divided into four areas: (1) the target group, (2) the object and its characteristics, (3) the characteristics of the programmes, and (4) the external context's role in influencing the diffusion processes. Finally, key lessons learned will be presented in the end of each section.

A path-dependent learning processes

The qualitative data clearly showed that the programmes themselves were influenced by, and path-dependent due to, knowledge and experiences from previous programmes. For example, in the case of IMP³rove the programme was partly built on experience from the Best Innovator Contest that is managed by A.T. Kearney in Germany. TYKES/ Liideri and GrowthAccelerator, as well, were designed based on experiences from previous programmes with a similar focus. Further, the programmes were continuously changed and refined as a result of learning processes. For example, IMP³rove's initial focus on a software tool was gradually modified to include training of consultants that could deliver services based on the software tool. Similarly, the Innovation Engineering System programme is a result of many years learning on how to re-use Deming's principles in the area of innovation. In the case of the Stage-Gate® process, the programme has been developed through a learning process based on both research and clients' product development practice.

It could be assumed that such relatively standardised organisational innovations like Lean Production would be possible to diffuse in a way that requires less adjustment on the route, concerning the concept and way of implementing it, and less education and training of end-clients and upgrading of diffusion mechanisms such as training consultants. However, the evidence in this study points to the fact that even these well-standardised organisational innovations demand that a programme is designed as learning processes. Innovation Management is less standardised than Lean Production and might therefore need both more education and training of diffusion mechanisms, and more continual development of both the concept and way of implementing it during an ongoing programme.

From a public policy perspective, this could mean a number of things. First, if a government entity is involved and participates as the funder of the programme, it should preferably view the programme as a learning process rather than a fixed and ready

programme from the start. Stakeholders included in the programme will continuously improve it by refining its content and structure through testing and learning. Second, the government entity should be aware of the issue of path dependency. In other words, that programmes tend to follow a 'path' set by the focus and direction of previous programmes. This is similar to the case of a company that tends to adopt organisational innovations that fit well with its previous way of operating, which may limit the ability to make the necessary more radical changes.

Factors affecting comparability of programmes

As a next step, factors will be discussed that might have important consequences for the design and outcome of the different programmes and for the comparability of programmes.

The overall purpose of an initiative affects its choice of target group, the content of what it delivers, and design of the programme, including the structure of stakeholders that will be involved. All seven programmes aim to increase the competitiveness of existing firms, either in a nation, region, or specific sector. The programmes' approaches for achieving this aim, however, differ. Four of the programmes are focused on Innovation Management. They all offer solutions for a more or less comprehensive approach to Innovation Management. However, while IMP³rove's main offering is a holistic framework for Innovation Management (the A.T. Kearney House for Innovation), the other three programmes (Innovation Engineering System, Stage-Gate®, and CENTRIM) provide different sub-offerings that together can create a comprehensive framework for Innovation Management. A sub-offering could be a cultural assessment, a development of an innovation strategy, or a support process for product innovation in the product development process. In the case of the Production Leap, the approach was increased production capability through a specific organisational innovation, Lean Production. GrowthAccelerator and TYKES/Liideri also aimed for increased firm competitiveness but in these cases this aim could be viewed as a secondary goal, as the main goal was to create 55,000 new jobs and value growth of £ 2.8 billion pound sterling (GrowthAccelerator) and to manage a demographic change in parallel with increased national productivity/innovation (TYKES/Liideri). In both these cases, the approach selected to reach overall goals was more flexible. In the case of GrowthAccelerator, barriers for growth were identified according to a specific methodology, which then led to firm-specific changes of management practices, while in the case of TYKES/Liideri, the approach was an overall learning process and the request was to disseminate generative ideas on new management practices as sources of encouragement, inspiration, and learning, rather than a single pre-defined specific organisational innovation.

The scale and initial focus on scalability of efforts also matter, and some programmes are major mobilization efforts in Europe or in single countries with a natural focus on scalability (IMP³rove, Innovation Engineering System, and GrowthAccelerator). TYKES/Liideri could also be viewed as programmes that are major mobilisation efforts in Finland. However, even if the programmes in Finland aimed to reach many, the programmes were highly decentralised and self-organised rather than structured as one

highly scalable model. The dissemination model for the Stage-Gate® process is not scalable in the same sense as the other programmes, but scalability is reached through easy access to books and articles, as well as through software that can support a Stage-Gate® process. CENTRIM, offers a scalable approach through its training and accreditation of consultants. Production Leap is currently not built to scale through a broader training of consultants. However, scalability is an important factor for societal impact and should preferably be considered as early as during the discussion of programme goals.

In addition, the age of a programme might influence dissemination in various ways. An older programme could possibly be more efficient due to a learning process but also risks getting stale, and may have even reached its obvious diffusion limits. There is also the 'fad factor' that makes companies look for the latest organisational innovation, which is not always the mostly well proven. The oldest programme included is 27 years old (Stage-Gate®) and the youngest is one year old (GrowthAccelerator). In the case of Lean Production, the initial standardization was done more than 20 years ago but Production Leap as a programme started six years ago.

Most programmes show clear indications of learning over time and, to some extent, a comparison needs to consider that some comparative weaknesses can more easily be improved in a normal learning process, while others may be of a more structural nature and harder to remedy. Evidence of learning processes, in itself, is also interesting to consider as it points both to identified problem areas and on solutions that also can be followed by estimates or measurements of progress.

Hence, with the intention of considering these major differences in overall purpose, scale and intent of scalability, and age, with due attention to learning processes, the discussion below will focus on elucidating similarities and differences between the programmes in order to extract points of learning.

5.2 Characteristics of target group

Most programmes, with the exception of Stage-Gate®, Innovation Engineering System and CENTRIM, target SMEs as the primary end-client group. The overall rationale behind the choice of SMEs is that they create a major part of all new jobs and/or that they lack the skills and resources to search for, learn about and implement organisational innovations. Some programmes, over time, have refined their target groups. In the case of TYKES/Liideri, the programme has scoped down the target group in order to increase the efficiency of the programme, while in the case of IMP³rove, the scope will increase and also include companies with more than 1,000 employees.

There are distinctive differences in how different programmes select SMEs. The most extreme of these is between CENTRIM, which supports many kinds of SMEs, and GrowthAccelerator that focuses on a very specific segment of 'high-growth potential SMEs'. In the latter example, high-growth potential SMEs are identified by using data on their growth numbers for the past three years and their capabilities for growth, such

as leadership. The logic is totally different and based on the overall goals and time frame of the respective programme. The first case aimed to revitalize companies that were in a worse economic condition than the average UK company, while the second case selected already successful companies and boosted their development further in hope of finding those that can be extremely successful in creating the new jobs needed in the British economy. In the case of CENTRIM, a successful outcome could be a company introducing organisational innovations, leading to increased productivity through the elimination of jobs, in order to survive. In the GrowthAccelerator case, the national objectives are to create 55,000 new jobs and grow value, which means that the target companies should preferably do both, even if some companies will create substantial new value without a job increase.

Innovation Engineering System, Stage-Gate®, and CENTRIM target also large corporations, and IMP³rove's definition of SME includes companies of up to 999 employees. When asked about lessons learned, two of the programmes commented upon their choice of target customers, and the importance of including larger companies. Both Innovation Engineering System and IMP³rove commented that it was hard to 'sell' Innovation Management to smaller companies and argued for the benefits of including companies with more than 100 employees, as they are more open to Innovation Management and hence, provide a better return on governmental spending. It was also clear from the IMP³rove case that SMEs look at their suppliers and others in the value chain and learn from them. These 'other' actors in the value chain might be larger companies, which in such a case, will act as role models and influence the SMEs and their desire for new ways of working. In the case of Stage-Gate®, it was clear that large corporations have been role models for other companies and have contributed to the creation of credibility for the approach towards both other companies and researchers. Larger companies also represent a large 'internal market' for the object (e.g. diffusion to subsidiaries) and they have the financial resources to purchase a solution or fund a programme.

Innovation Engineering System also viewed governmental ministries as end-client groups. In the case of IMP³rove, governmental agencies were seen as important stakeholders that could serve as market channels as they commonly have a broader reach to SMEs than does the average private consultant. Also, other programmes interacted with local governments and other local actors in order to reach SMEs, such as through CENTRIM and Production Leap.

The discussion above was about choice of end-user groups. However, two of the programmes - Innovation Engineering System and IMP³rove - do not directly target the end-user groups, but instead target consultants or 'internal change agents' who, in turn, will target the end-user groups. In these two cases the consultants are trained and certified by the programme co-ordinator. CENTRIM also targets consultants as one type of client in order to train and accredit them for using CENTRIM-developed tools and approaches for a broader SME audience. There are also examples of 'semi- solutions' where the programme co-ordinators clearly identify and target the end-user group and

have connection with the companies through an application process, as well as targeting consultants in order for these to perform the support services offered from the programme. Examples of this type of solution are GrowthAccelerator, TYKES/Liideri, and Production Leap. These programmes do not formally train and certify their consultants, although the Production Leap consultants receive university course credits. Finally, Stage-Gate® primarily targets companies but also certifies their software partners, which then could be viewed as a second target group.

What can we learn?

Many programmes have focused on SMEs. Over time, most of the programmes have refined their target groups and either narrowed or broadened their end-user group. In the cases where large corporations and governmental departments were a focus, these were shown to be important role models or market channels to other companies, such as SMEs. Several of the programmes targeted consultants or internal change agents in order for them in turn to target the end-user groups. As organisational innovations consist of a high degree of tacit knowledge, face-to-face interaction through consultants or internal change agents play an important role in the diffusion of the innovation. In order to make the programme scalable, some of the programmes had strategically chosen to focus on existing, and often local, advisors. In three of the cases - CENTRIM, IMP³rove and Innovation Engineering System - the advisors were also educated and trained, albeit with different intensity and depth. Note that as the relative investment in transferring knowledge to end-user groups by educating and training consultants (diffusion mechanisms) is high, it indicates that a scalable programme for the dissemination of organisational innovations needs to make education and training of consultants and other diffusion mechanisms very efficient. A scalable programme therefore, not only needs to ensure that there is a pool of existing, scarce, resources such as consultants in a region or country, but also to efficiently educate and train these in being able to transfer knowledge to targeted end-user groups. In the case the organisational innovation is not only new to the firm (e.g. in the case of Lean Production) but also more or less new to the world (e.g. the case of Innovation Engineering System), the need for education and training could be even higher. Finally, the idea of looking into growth-oriented SMEs seems to be important and the ways of distinguishing and identifying this category from others viewed as less growth-oriented seem to be of significance.

5.3 Characteristics of object

What is the object

Looking at the different objects from a novelty perspective, TYKES/Liideri, which aims at experimenting and develop totally new and often research-based solutions, are at one end while GrowthAccelerator, which provides more traditional management advices, is on the other end. In between these two extremes, from a higher degree of novelty to a lower degree of novelty are (a) CENTRIM's Innovation Management based on action research, developing new knowledge that gradually gets standardised for broader diffusion, (b) Innovation Engineering System's Innovation Management approach,

which is based on Deming's principles and on continuous learning and standardization, (c) IMP³rove's Innovation Management conceptualised as a comprehensive standardised model, which in turn is based on current knowledge, (d) Production Leap with Lean Production, which is a well-standardised approach (although different interpretations still exist when this model is introduced in company settings), and e) Stage-Gate®, which has become a standardised practice among Fortune 1000 companies. The different degree of novelty could be expected to influence the rate, or at least the speed of diffusion of the object.

Interestingly however, the new management practices are not the primary 'objects' that are diffused by the programmes. Instead the objects diffused can be viewed as frameworks, tools, and/or work processes that, in turn, support the company in changing its management practices in a desired direction. In some cases, these are supported by principles. For example, Innovation Engineering System and Stage-Gate® have principle-supported frameworks and tools for how to best implement a systematic way to work with product innovation in companies.

The tools and work processes in early phases of the intra-firm diffusion were surprisingly similar between the programmes (except for TYKES/Liideri). The tools used towards the end-client group were assessments and/or audits and benchmark databases, and it was common to have some kind of awareness or educational activity and insight workshops supported by facilitators. In addition, the programmes typically created some sort of online portfolio in which the knowledge and work processes to be used were 'collected' and could easily be accessed (exceptions were TYKES/Liideri and Production Leap). Another common approach was to create online or offline learning networks through which members of the programme could learn from each other. However, it seems like the design of the learning networks varies considerably – some being carefully facilitated (CENTRIM) while others are more self-organising (IMP³rove online and TYKES offline).

The different tools were well standardised and most commonly they were parts of a portfolio of offerings from the programme co-ordinator. The exceptions were IMP³rove and GrowthAccelerator, which provided a bundled offer consisting of an assessment, benchmark, and workshop, for example, in the case of IMP³rove, and an assessment and workshop in the case of GrowthAccelerator. In contrast, the tools from CENTRIM were offered as sub-offerings, which enabled a client to choose to buy one or more of the six audits for self-assessment or to buy one or more of the audits bundled with consultancy services. As complexity of a product negatively affects the diffusion rate, it could be expected that more 'holistic single- package' offers require a longer time to diffuse and/or more training and education of change agents as diffusion mechanisms.

The tools to end-clients were one part of programmes' offering. The other part of the 'object' was the offering to other target groups such as consultants (in the case of CENTRIM, IMP³rove, Innovation Engineering System, and partly GrowthAccelerator and Production Leap), internal change agents (in the case of CENTRIM, Innovation Engineering System and Production Leap), or software partners (in the case of Stage-

Gate®). Most programmes offered some sort of education and training, and four of the cases also offered a certification of the consultants or other partners. The reasons for this are the fragmented nature of the Innovation Management market and the fact that training and certifying consultants could establish a common framework for Innovation Management among them and provide them with skills necessary to support end-clients. In three of the programmes, IMP³rove, Stage-Gate® and CENTRIM, the partners had to be re-certified either if they didn't use the tools with a certain frequency or after a certain number of years.

Trajectory or a static object

The objects diffused through the programmes have been changed and further developed over time, in some cases, significantly. IMP³rove started as an on-line assessment tool for SMEs, but it was soon realized that a stand-alone tool is of limited value even if connected to a benchmarking database. Hence, the initial Innovation Management assessment was complemented by consulting services in Innovation Management, including training and certification in Innovation Management and Innovation Management consulting. Hence, the object could rather be viewed as a trajectory leading to the overall purpose of the programme. Similarly, the Innovation Engineering System programme has been developed over time, starting as a new curriculum for university/college students in 2005. Four years later, an IT infrastructure was created, which was followed by training programmes for leaders and other change agents in 2010. In addition, sub-components are continuously upgraded, for example, how to train the trainers in a more efficient way, and the content and structure of the IT-platforms. Hence, the object is in continual transformation, and can be viewed as a trajectory leading to both broader areas of application and the improvement of training processes.

The Stage-Gate® process is based on ideas developed from research and published almost 30 years ago. These have influenced all kinds of companies all over the world. However, partly influenced by later developments, the Stage-Gate® process has been complemented by other 'pillars' developed by the Product Development Institute, as well as by ideas from other substituting or complementing organisational innovations such as 'agile development' and 'lean philosophy', which have shown an extremely strong diffusion in recent years. Hence, here, too, the object can be viewed as a trajectory.

In the Production Leap, the object itself is 'Lean Production', which is an organisational innovation inspired by the Toyota Production System and standardised by various actors. However, it is a complex innovation, and in the case of the Production Leap, the focus of the object has changed from methodologies and tools to culture, leadership and learning. Although, tools in Lean Production, such as value stream analyses, are still taught and practiced, the focus has shifted over time through a conscious learning process. Thus, here, too, the object can be viewed as a trajectory.

In the case of CENTRIM, the basic mission is to conduct action research. This means working closely with industrial partners to transfer tried-and-tested results, but at the same time, developing new knowledge, which is being transferred back to the industrial

partner. A more detailed look at the Profitnet programmes reveals a continual process of testing new methods in order to increase the impact on client development. Thus, this case, too, is clearly a trajectory.

Tekes' programmes show the same pattern of development. Earlier programmes such as TYKE and TYKES have been evaluated to provide input for the development of the next ones, such as Liideri, which would indicate a continual development trajectory. However, the exact impact of this is hard to evaluate.

Finally, the GrowthAccelerator builds on learning from earlier regional Growth projects. However, as this is a new programme started only a year ago, and designed to last for only two more years, there is no evidence that it was designed as a learning process.

Emphasis on conceptualization and IPR

Except for the case of TYKES/Liideri, products and services are well conceptualized and packaged. As most products and services are presented on a programme's website or as part of a portfolio on an IT platform, they more or less need to be well packaged. Branding and trademark protection of tools were emphasized in the cases of IMP³rove, Innovation Engineering System, Stage-Gate® and GrowthAccelerator but not in the other cases. In some cases, the object is protected, such as the Stage-Gate® process and the IMP³rove framework, but in several programmes it is not the objects that are protected but rather the tools used for analysis that are trademarked (e.g. Innovation Engineering System, IMP³rove, GrowthAccelerator). One reason is that the specific solution the coaches and experts deliver varies and is company-specific. For example, it is possible that GrowthAccelerator coaches could use a trademarked product as part of their coaching but it is not anything that GrowthAccelerator would be able to protect, as the tools are most probably owned or licensed by the consultant.

Ease of observing, testing, and evaluating objects

Many programmes have developed ways for the client to observe, test and evaluate new management practices for Innovation Management. One of these involves using assessments and audits in which the firm can observe its strong and weak areas. If this assessment is then compared with benchmark data, the firm can gain an understanding of its improvement potential. In the case of Innovation Engineering System, the Innovation Engineering Leadership Institute provided insights, as well as a chance to test the new management practices. Testing the new management practices was also possible through their 'Jump Start an area' offering. In the case of Production Leap, insights were created primarily in Awareness seminars through the use of games in which the participants themselves can experience and learn principles and practices of Lean Production, but also through a university course. Then the new management practice could be tested in pilot projects in the participant's own companies. In the case of Stage-Gate®, insights and 'proofs' were created through the distribution of books, electronic newsletters, research papers and a number of articles. In this case, the continuous development of an implemented solution was strongly emphasized and a

new version of Stage-Gate® was publicized and made available for learning. However, with the exception of Production Leap, the other programmes didn't use visualization tools, and there were no examples of the same kind of games that are common in Lean Production training.

One standard or several tailored solutions

In all programmes there are processes that are well structured and standardised. Most commonly these standardised processes and tools are found in the inter-firm diffusion stage and in the early phases of the intra-firm diffusion process (e.g., trigger a desire to change and a perception of a feasible solutions), while standardised processes for deployment and sustainability of an implemented solution were less common among the programmes. Overall, TYKES and Liideri are the least standardised programmes, with only the administrative processes that are co-ordinated by Tekes being standardised. However, in the other programmes, tools and certain work processes have been standardised, including how to do an audit, or how to facilitate a 3-4 hour workshop and provide an insight report. The degree of standardization of work processes seems also to increase over time as the programme runs, due to a continuous learning process on what works and what doesn't work. However, even if the work processes were standardised, this was obviously not true for firm-specific solutions. As both GrowthAccelerator and TYKES/Liideri were focused on overall national goals, the firm solutions in these cases were even more tailored towards the single firm's needs in order to reach overall goals. In addition, lessons learned from the IMP³rove case were that customization of support services played an important role for actively involving the customer.

Research-based or practitioner-based content and processes

The emphasis on research-based solutions is most clear in the case of TYKES/Liideri. Other than that, no formal requirement for a research-based approach has been identified. Instead, the different programmes start from either a research-based or a practitioner-based solution and end up by being based on both. For example Stage-Gate®, TYKES/Liideri, and CENTRIM started from a research-based solution, while IMP³rove, Innovation Engineering System, GrowthAccelerator, and Production Leap started from a practitioner-based solution. Currently, however, all base their solution on input from both research and practice.

What can we learn?

From a novelty-perspective, the programmes differed from being truly experimental and focused on creating organisational innovations to the dissemination and application of existing and well-standardised management practices. These new management practices, however, were not the primary object that was diffused by the programmes. Instead the object diffused could be viewed as frameworks, tools, work processes, and principles, which, in turn, support the companies in their efforts to change their management practices in a desired direction. The tools and work processes used in early phases of the intra-firm diffusion process were surprisingly similar between the programmes (with the exception of TYKES/Liideri). The tools and work processes used in later phases of the intra-firm diffusion were less standardised in most programmes. However,

the tools and work processes for end-clients were only one part of the programmes' offering. The other part of the offering was the services to other target groups such as consultants, internal change agents, or software partners. Further, the object is not static but could be viewed as a trajectory, an object that is continuously refined over time in order to reach overall goals. One way to sustain the value of the implemented organisational innovation is to refine it with new complementary innovations or even partly substituting organisational innovations. Most programmes had standardised their offerings very clearly, and some had protected their tools and work processes with trademarks. The programmes had made it possible, to various degrees, to observe, test, and evaluate the innovation. Among the seven programmes, Production Leap, Innovation Engineering System, and Stage-Gate® focused most on these aspects. Even in the case the object is well standardised and had been made easy to observe, test, and evaluate, such as in the case of Production Leap, subjective interpretations were still the norm when implementing the innovation. The tools and work processes in early phases of the intra-firm diffusion process were mostly standardised while the specific work processes for deployment and sustainability together with the final firm solution were most commonly not standardised. The processes used by the programmes also tend to get standardised over time as a result of a learning process. In every case, the solution was tailored to the conditions of the specific firm. Finally, most programmes used both research-based and practitioner-based solutions.

5.4 Characteristics of the programme

The set-up of the programmes will be discussed below with respect to who is managing the programme and the stakeholders and activities involved in the inter-firm and intra-firm diffusion of the object.

Set-up of programme

Two of the programmes are run by consortia of private companies, and funded by government (IMP³rove, GrowthAccelerator). Universities have played important roles in the set-up of three programmes (Stage-Gate®, CENTRIM, and Production Leap), albeit in different ways. TYKES/Liideri are programmes that have been managed by government entities through the public funding agency (Tekes), while Innovation Engineering System is a genuine example of triple helix collaboration, involving industry (Eureka!Ranch), university (University of Maine), and government (NIST).

In both IMP³rove and GrowthAccelerator, private consultancy firms have developed the basic ideas, tools and work processes used. A.T. Kearney partnered with the German public research institute Frauenhofer-IAO to further develop the basic ideas of the IMP³rove programme and to jointly manage the programme. Due to IMP³rove's intention of covering Europe, national partners are important actors entitled to co-ordinate other stakeholders such as local consultants, intermediaries, financial actors, and policy makers. The latter were identified from the very beginning and represent a broader part of a local eco-system. In later years, universities, too, have entered the IMP³rove arena. In the case of GrowthAccelerator, Grant Thornton UK LLP (financing

and lead partner) partnered with Pera Consulting (growth coaching and innovation), Oxford Innovation (financing), and Winning Pitch (growth coaching), and the four main partners have different regional responsibilities for the programme. Based on their individual networks and word-of-mouth they succeeded in identifying Growth Managers and having more than 1,000 experienced local consultants becoming Growth Coaches as part of the programme. The local focus is therefore important in this programme, too. Innovation Engineering System, which is based on triple helix collaboration, takes its starting point in practical experiences from product development in industry and from private consultancy through Eureka!Ranch, but joined forces with the University of Maine to create the Innovation Engineering Institute (IEI). The IEI took the lead in developing methods and tools as well as developing education programmes and organising training for industry and consultants. The role of the university was also to introduce and, together with the private firm, develop a curriculum in Innovation Engineering for university students. Further, the IEI works together with government agencies in a multitude of ways, one being the development of a National Innovation Marketplace, and another, on a local and regional level IEI uses its efforts to link up with local government to reach companies. NIST/MEP is an example of one such partner with 1,300 consultants. An additional type of partner is called connector, and these (accountants, lawyers, etc.) serve the important role of network brokers for SMEs. Here, too, the emphasis on local resources is therefore clear.

Thus, three very broad-scale national programmes use experienced people from industry or the consultancy world as initiators. Public funding and interaction with the public sector, however, are important in all three programmes, especially since both IMP³rove and Innovation Engineering System learned that it is not easy to sell Innovation Management to SMEs without public funding. Although, universities have played some role, specifically in education focused on the organisational innov ation, the main ideas come from the private sector.

In Stage-Gate®, CENTRIM, and Production Leap, universities play a more important role. For example, university research is the foundation behind the Stage-Gate® and CENTRIM programmes, although, in both cases, new structures have been developed to facilitate the transfer of knowledge and the practical application of what had been discovered. Stage-Gate® was originally developed through empirical research studies, and both Stage-Gate® and CENTRIM are continually developing their products through research in close cooperation with industrial partners or clients. Stage-Gate®'s three-pillar approach is built by a research and method/tool-developing unit called the Product Development Institute, a consultancy arm called Stage-Gate® International, and co-operation with seven selected software partners. The consultants primarily interact with large corporations. Although CENTRIM provides some consultancy and facilitation of learning networks, an important group of clients are consultants who are being trained and accredited, making CENTRIM's tools and work approaches to develop innovation competence available for many more companies in the UK and abroad. Government's role is a minor one in the case of Stage-Gate®. In the case of CENTRIM there has been funding of the development of new approaches and partial financing of ongoing

operations such as learning networks for small firms. In order to identify potential end-client SMEs, CENTRIM also develops relationships with local government and local companies that can serve as ambassadors for the programme. The universities play a different role in Production Leap. In this case, one university is part of the organising group, assuming responsibility for awareness and education, while several other universities facilitate the education of end-users and consultants. The programme leadership and management of the coaches are the responsibility of an applied research institute. The Production Leap, too, has built a structure with strong local presence, involving local universities for training and local coaches working in parallel with co-coaches from the applied research institute. Hence, the design of this programme builds as much on practical experience of consulting as on university experience of education and research.

Finally, although Tekes is both the driver and the co-ordinator, other stakeholders such as researchers at universities and research institutes, as well as consultants, trade unions and employer organisations are involved in the projects and influence programme development to various extents. The structure of this programme, in contrast to the others, is very much decentralised and, in the case of the TYKES programme, Tekes did not have any direct contact with consultants or researchers, unless they were part of an advisory board. The relationship with the client group was also quite loose and could be characterised more by a formal relation in order to manage applications, evaluations, and the like.

What can we learn?

The organisational structure of all programmes starts from a smaller unit of a few partners who are responsible for the development of the content, and the process of reaching end-clients. The main driver has been the private sector, a university or, in one case, the government. Private consortia, with ample funding from government, drive the programmes most focused on scale. If the ambition is to have a wide reach, the programme will have built a structure to enable it to contact many potential client firms. This is most commonly achieved by training and using local resources such as consultants and intermediaries. An interesting aspect is the variety of approaches selected such as the 'Eco-system approach' used by IMP³rove and Production Leap, the 'Triple Helix approach' used by Innovation Engineering System, the 'Consultancy approach' used by GrowthAccelerator, Stage-Gate®, and CENTRIM, and the 'Research approach' used by Tekes. It is also of interest how Innovation Engineering System as well as IMP³rove works with universities in educating and training the students, who are the next generation, in the innovation mindset and techniques.

There is evidence that the Web is not sufficient as a communication tool with regard to new and complex organisational innovations such as Innovation Management. Hence, in most cases it seems to be necessary to achieve a closer contact to the SMEs by using solutions building on existing local actors, who both can assist in establishing contact with SMEs and become part of the team providing services to the SMEs. This, in turn, places a responsibility on the programmes to upgrade local consultants, universities, research institutes, or other service organisations.

Scalability of programme

Some of the programmes were built to scale from the start as a result of an outright demand from funders and/or an insight that their own resources were too limited to reach very ambitious goals. IMP³rove is built on an assumption of scalability, which was shown as early as in the first step of developing an electronic self-assessment tool providing SMEs with the opportunity of comparing themselves to European benchmarking data. The benchmarking questionnaire and reports first became available in five, and then in eight, languages in order to facilitate the dissemination of the tool. However, it was soon realised that SMEs needed consultancy support on how to close the identified gaps in relation to best practice. Hence, an international training (two-day courses) and certification scheme for consultants was developed enabling individual consultants to be certified to work under the trademark of IMP³rove. Further, IMP³rove has gathered 60 Innovation Management tools in a tool box available for people looking for tools and linked to those that can supply the tools. These tools are not standardised, however. IMP³rove started in Germany, intends to cover Europe, and has national contact persons in several countries. In addition, IMP³rove has also created a Virtual Management Academy to provide support for consultants. The question is whether the programme has succeeded becoming sufficiently scalable given the present records of having reached 3,500 companies, and trained 500 persons at the lowest level (IMP³rove Guides) during its seven years life span.

The GrowthAccelerator is another programme that from the outset was built to scale in order to reach 26,000 companies in three years, primarily through two means: First, there is an initial selection phase where the company is being evaluated by a Growth Manager and a Web-based analytical tool that provides an automatic report highlighting the individual company's barriers to growth. The process is thereafter highly individualised, and the scalability depends primarily on the programme's ability to locate and contract enough experienced consultants that can provide specialised services for a limited number of days (max 15) during a 6-12 month period. There is no regular training or accreditation of consultants to guarantee quality, but only a rigorous two-day selection process and follow-up by the clients during the process.

CENTRIM and Innovation Engineering System show similarities in their approaches to scale. Both realised that their internal resources would not be enough to reach all potential client companies so they resorted to training and accrediting consultants in the use of their approach and tools. CENTRIM has a way of assuring the quality of consultants by demanding that they use the approach for which they have been accredited, at least twice a year. However, CENTRIM consciously also used learning networks as a way to systematically utilise peer-to-peer learning mechanisms. This means that there is less need for traditional trainers and consultants, but at the same time the approach demands highly skilled facilitators that need training and accreditation. Innovation Engineering System aims at scaling both through a contract with NIST (which is also behind the national diffusion of TQM in the United States) for training their consultants to deliver Innovation Management's approach to a large group of SMEs in the United States, and by focusing on training internal change agents in larger corporations. They have also

increased the status of trained change agents and consultants by giving them innovation black belt degrees (similar to the Black Belts within the Six Sigma movement). Stage-Gate®'s own consultant resources are limited, but it has since long had 'scalable parts' such as the dissemination of Stage-Gate® best practices through books, articles, and increasingly important, through software partners. In comparison, the Production Leap is not built to scale through the training of many consultants, although the participating consultants are upgraded by attending an academic course and by participating in two reflection days twice a year. Neither has Tekes built its national programmes to scale. They seem to be very much decentralised and the only scalable parts relate to administrative routines by Tekes itself.

What can we learn?

One interesting fact is that the programmes run by private consortia supported by large amounts of public funding have had a strong focus on scalability from the start (GrowthAccelerator and IMP³rove). Also, in some cases the development of more scalable approaches was the result of insights that their own resources were not sufficient (CENTRIM and Innovation Engineering System).

Even when the scope is broad and there is an objective of achieving national impact, the programmes have not always been designed consciously to scale. However, there are some parts that could easily be re-designed to provide a greater impact, such as the Production Leap where this can be achieved by making it a priority to train consultants. The programmes that from the outset were intended to scale might still have to gradually find their own way, such as in the case of IMP³rove. There are ways of scaling and still keeping control of quality through accreditation processes, but it seems important that there be an incentive to get accredited. The low number of accredited IMP³rove Experts is an issue to look into given the organisation's clear ambition of scale.

Innovation Engineering System's decision to contract with NIST in order to diffuse their approach to SMEs on a large scale is interesting because NIST is behind the dissemination of another organisational innovation, TQM, in the United States. In the case of the organisational innovation TQM (TQC) there are many examples of how national structures or even European structures have been set up to diffuse organisational innovations on a massive scale. The inspiration is the Japanese structure for TQC, such as the Deming Prize and the National Quality Month October, which includes national, regional as well as intra-corporate structures. Similarly, structures were created in Europe by EFQM, and in the United States by NIST (Malcolm Baldrige National Quality Award). It may be possible to learn both positive and negative lessons from these efforts. However, despite similar basic inspiration, there was never any Lean Production in Japan. Lean Production was coined by transferring experiences from Toyota to Western economies. In Sweden, the Production Leap could be an actor contributing to dissemination and standardization of Lean together with numerous other initiatives.

Contracting and quality assurance of consultants

Training

In order to scale, training programmes for consultants have been developed by most of the programmes. CENTRIM trains and accredits consultants in using its tools. Facilitators of learning networks are trained in two- and three-day courses and are provided with an operational manual with guidelines and tools. However, in order to be selected as a possible facilitator, an individual needs to have considerable experience, preferably also in facilitation. In addition, CENTRIM offers coaching to facilitators and refresher workshops, on-the-job mentoring and telephone support. In IMP³rove, too, consultants and intermediaries are trained and certified. The training is a step-by-step process building up competence in Innovation Management and Innovation Management consulting. Each course is two days and leads to a step in a four-level process from guide, to expert1, expert2 and finally, IMP³rove auditor. Innovation Engineering System trains and certifies change agents in companies, colleges, and governmental agencies. One difference is that they have borrowed the Black Belt terminology from Six Sigma and that their training period is much longer – at present 18 months. However, the goal is to develop a Black Belt in innovation engineering in a much shorter time through the use of a new learning approach, Cycles to Mastery, which could bring the training period down to 3-6 months. In addition, other employees are trained to the level of Green Belt as part of the deployment process. Finally, the coaches within the Production Leap are all trained in a standardised way of working and they attend the regular university course (five two-day sessions) in Lean Production and receive university credit, but no formal certification for the programme.

GrowthAccelerator coaches are not trained in a traditional way, as they are recruited based on their expertise. However, when they are new, they undergo a two-day coaching assessment process. Finally, Tekes does not train anyone and the contracting is between firms and advisors/researchers. Stage-Gate® certifies vendors through a three-step process in which they have to prove that their software lives up to 200 criteria, submit proof of installation, and demonstrate on-going achievements.

Quality assurance

When consultants are used, quality assurance becomes a necessity for the programmes. In the case of the consultants accredited by CENTRIM, there is a requirement that the tools be used at least twice a year. Otherwise, the consultant loses the accreditation. The requirements for training and accreditation also concern university staffs and others directly linked to CENTRIM as a means to assure the quality of the interventions, especially with regard to a facilitator of learning networks, a task that can be highly demanding. In IMP³rove, consultants are contracted to follow the framework and work processes presented in the training and they receive certificates that are valid for two years. In addition, IMP³rove collects feedback from the SMEs and from the consultants after the assignment. Innovation Engineering System relies on its certification process, as well as on its IT-platform, which enables Black Belts to obtain support from other Black Belts and tracks Black Belts' activity level (and number of requests sent). Those applying as coaches in GrowthAccelerator are evaluated through a two-day coaching

assessment process. In addition, during the coaching process, the GrowthAccelerator receives regular feedback from clients about the coaching, and the coach can be replaced if not delivering according to expectations. Tekes' quality assurance is embodied in a requirement of a CV for the consultant before he/she was assigned. In the case of Stage-Gate®, the software partners and their software were quality assured through a three-stage process. In addition, they need to be re-certified every other year. Stage-Gate® Ready vendors can display a Stage-Gate® Ready logo on their products, Website and in their promotional material. Finally, the ongoing quality assurance in the Production Leap is built on bi-weekly pulse meetings involving all educators and coaches in the programme, and designed to follow up progress, focusing on actions and sharing information. In addition, twice a year, two-day reflection meetings are arranged to provide opportunities for the coaches to share experiences and improve.

What can we learn?

Almost all the programmes require training in order to upgrade consultants so they gain an understanding of the specific content needed and the process that conveys this content. Several of the programmes that actively targeted consultants have also introduced accreditation of these in order to make the programme more attractive, at the same time as the accreditation process serves as a means for quality assurance. Innovation Engineering System has borrowed the black belt concept in order to make it even more attractive to undergo training and receive proof in the form of a black belt diploma. Three programmes have re-accreditation requirements in place, one uses conditional demands, and the others put a demand on re-accreditation every other or third year. In most cases it seems as if there is a clear need for a procedure for upgrading consultants and the way to secure the process is to create some kind of accreditation mechanism.

Design of activities for inter-firm and intra-firm diffusion

Different key activities for inter-firm and intra-firm diffusion will be discussed below under the sub-headings of *Desire* and *Feasible*, *First-Trial*, *Deploy*, and *Sustain*.

Desire and Feasible

Awareness is typically created through awareness seminars close to potential client companies and arranged together with regional actors (Production Leap), or through discussions with local government, and through identifying focus groups of firms that could potentially become ambassadors for the programme (CENTRIM). For Innovation Engineering System, most awareness has been created through partners such as local universities and government organisations, the NIST/MEP advisors, and through the programmes own seminars. Innovation Engineering System approaches potential end-clients in a standardised manner, asking company leaders for their perception of where on the growth-maturity curve their company is located. This question serves as a starting point for a discussion about the need for innovation and Innovation Engineering as a potential approach to increase speed and reduce risks associated with innovation. Since its start, Stage-Gate® has built awareness through published books and research articles, but also uses its own seminars and gives speeches at conferences. Growth-Accelerator stressed viral marketing as a tool for awareness in their recruitment of coaches. However, viral marketing probably plays a role in all other programmes, as

well. GrowthAccelerator used central marketing/information campaigns, as did TYKES. In the case of IMP³rove, being an EC project, other EC initiatives refer to IMP³rove, and IMP³rove is also part of other initiatives (cross-promotion/ bundling). IMP³rove also made large investments in an IT platform. However, some programmes expressed doubt about using their Website as a recruitment instrument for SMEs. GrowthAccelerator views its Website more as a way of recruiting Growth Coaches. However, the Website and information material typically also include short 'success stories' of companies that already are participating. These can contribute both to the desirability and feasibility of the programme, provided the description is detailed enough (e.g., Production Leap and GrowthAccelerator). Awareness can also be created through 'connectors' who inform, connect, and, in some cases, even request change. Examples of these connectors are financial actors and policy makers in the case of IMP³rove, and financial actors and lawyers in the case of Innovation Engineering System. These connectors can translate the potential impact of the organisational innovation from legal, financial, or other perspectives. They also commonly have access to the senior management team of the companies, necessary to influence in order to create a desire for change.

A major learning point emphasised by GrowthAccelerator, Innovation Engineering System, and Production Leap is the importance of committed leadership teams for the success of the change programme. They *"are buying into the project and view themselves as becoming leaders of a high potential programme"* (GA) or *"they themselves assume the responsibility and do not delegate to someone else"* (PL). Hence, a major lesson learned is that programmes need to create mechanisms to be able to identify those companies with a leadership team that provides a potential for success. The programmes also need to have the strength to say no or postpone the process in case the requisite commitment from the leadership team is missing. Linking this issue to the earlier comment on growth-oriented companies, GrowthAccelerator's profiling of a high-growth potential company includes *"a leadership team committed to growth"*, expressed as at least doubling in three years in terms of jobs created or in turnover.

Some programmes single out contracting as a very important activity for success. Others do not mention contracting at all. This might naturally depend on the programmes' view on the deployment process and of the nature of the offer. For example, a learning network, in which lessons learned are shared between companies, needs rules for confidentiality. According to CENTRIM, it is absolutely necessary to establish ground rules, including mechanisms for confidentiality, for the functioning of learning networks, and this is an important task for the facilitator to accomplish. The Production Leap, too, views contracting as a key to success. This is where parties' obligations and mutual expectations are outlined, and the contract includes a requirement for the active participation of top management, and on a formal Board decision to participate. In the case of Innovation Engineering System, the contract relates to the first 'wave' as the whole philosophy is to contribute to the leaders' confidence in the approach. The contract process could therefore be divided into three-month milestones in which the company commits more and more for each milestone reached. This makes sense as the investment from a company perspective does increase over time as more

people are involved and the possibility of turning back is lessened. In the case of IMP³rove, the standardization of the consultancy process has been increased over time, which is why the rules and conditions for contracting might be clearer in the future. In other programmes, the contracting process is not that clear.

Education and training are part of most programmes towards end-clients. CENTRIM offers two-day training and accreditation for project managers, including an Operational Manual with guidelines, tools and templates for the job. However, in the Profitnet programme, most learning occurs through peer-to-peer networks in combination with regular training sessions by outsiders. In the Production Leap, two or more 'change agents' from the end-client take the same basic university course in Lean Production as the coaches do. This course is also given frequently and in many local/regional locations. In the case of GrowthAccelerator, the focus is on removing barriers to growth but participants are offered the opportunity to upgrade their competence in master classes and workshops. In the case of IMP³rove, training and education of end-clients were not emphasised in the collected data. Innovation Engineering System educated leaders and other employees in a standardised way, from three days (Innovation Engineering Leadership Institute) to three months (the Jump Start programme) of education and training.

First-Trial

The opportunity to test the approach is an important feature in some programmes, while others do not emphasise this. The two programmes that have emphasised trials as clear activities in their dissemination process are Production Leap and Innovation Engineering System. In Production Leap, all new modules are initially introduced in a pilot group being trained in a standardised work approach. This is very similar to the approach in Innovation Engineering System where a smaller group of employees focuses on a narrow area in an experimental way and in a short term (three months) test and show results in order to gain insights and create confidence among leaders. In fact, Innovation Engineering System's approach for deploying the solution is to have the company conduct a number of low-risk and low-stress experiments, called 'innovation waves'. Conducting a sufficient number of these 'waves' engenders confidence among members of the top management team, which will lead to a full deployment. The participants are selected among those individuals who are most positive to participate and are seen as entrepreneurial, optimistic, and proactive scientists (tested by a specific tool). In the case of Tekes, in which the programmes could be viewed as 'experimentations' on a large scale in order to find new management practices, the development projects, by definition, are experimentation and trials through joint development by the firm and the consultant/researcher.

Deploy

In some programmes, the deployment process is well structured, and to some extent, standardised. In CENTRIM's Profitnet there is a structure of three hour meetings every month where all participants share their strategies and key issues and the other participants provide feedback resulting in the presenter deciding what to accomplish until next month. This is followed up and discussed by the other participants in the following

month. This is a managed, highly structured process providing feedback from many different perspectives – and opportunities to learn from others' failures and successes. The Production Leap follows a process called the Wave, which has become more and more structured and standardised. It is an 18-month standardised and well-tested process in which companies work on introducing Lean Production with the help of both education and coaching from the programme. The intention is to gradually develop insights, knowledge and a driving force for change within each company. The process starts by developing awareness in the steering committee, and formulating the company's own goals and strategies. One way to develop a consensus is by producing a booklet on the company's principles. A basic theme is that the company needs to take all new tools and methods introduced in pilot projects, and customise them. After the pilot projects, new groups can use the same approaches. Innovation Engineering System used the Waved approach, a design similar to the one used by Production Leap, where, after some waves (pilot projects) when management feels confident that it has found the right approach, all employees are trained in that new approach. In the case of Innovation Engineering System, the employees then are trained and get green belts in Innovation Engineering. Stage-Gate®, too, has developed standard processes for deployment and these are also supported by approved programmes from software companies. Stage-Gate® has also developed a number of heuristics concerning deployment, such as that the first 90 days are crucial for deployment, that both design and deployment need to be considered, and that there are five ways of communicating to achieve successful design and deployment: (a) make the message visual, (b) tell a story, (c) make it accessible, (d) make it valuable, and (e) confirm expectations. However, some programmes have less standardised deployment processes. For example, IMP³rove has developed a common consultancy process on a high level. After this, however, the consultants use various tools and methods depending on their experience. Similarly, GrowthAccelerator follows a standardised way to identify barriers to growth. After this is done, however, the consultants respond to the individual needs of each company.

Sustain

The design of the different programmes seems to be affected by the programme co-ordinators' varying degree of emphasis on sustaining the newly deployed management practices. Three programmes had designs that better support the sustainability of an implemented solution. These three were Innovation Engineering System, Stage-Gate®, and Production Leap. In the case of Innovation Engineering System, the emphasis was very much on building internal firm confidence at a rate that suited the firm in question. Educating and training change agents could sustain the deployed solution over time, not only by changing the organisation, but also by changing the mindset, and by increasing the number of 'experts' that had a stake in the new solution. In the same way, Production Leap educated and trained internal change agents and a consultant supported the firm in question for a longer period of time in order for the new organisation to be established, and for the mindset to change. In the case of Stage-Gate®, the emphasis was not so much on the confidence of change agents and leaders as it was on providing continuous insights to the internal stakeholders in order for them to feel confident about their solution and path, as well as to update their solution with complementing organisa-

tional innovations in order for the solution, over time, to reach overall goals. CENTRIM has another type of continual support through add-on programmes beyond the initial Profitnet Standard programme, such as Profitnet Plus, which focuses on innovation, and Profitnet Buddies, which focuses on extended mentoring. Both programmes continue the same peer-based learning network that is built upon regular person-to-person meetings.

An online platform was highlighted by many as an important tool in regards to sustaining organisational change. Knowledge and insights could continuously be stored and shared on platforms, and in some programmes, the participants could interact and learn from each other. The support of an online platform not only provides new relevant insights, which can be used by the firm, but also creates some kind of rationale of why to change and why to sustain the change, as there is evidence that others are using the same approach and benefitting from it.

What can we learn?

Regarding the intra-firm diffusion process, all programmes had designed activities or offerings affecting the desirability and feasibility of the innovation. Some programmes also included opportunities to test and evaluate the innovation, while fewer had standardised the deployment process. The step to sustain the innovation was less developed among the programmes. The most sophisticated programmes measured by how many of the different steps in the intra-firm diffusion process were carefully designed in form of activities and offerings were Innovation Engineering System, Production Leap and potentially Stage-Gate® (data is missing to allow a complete evaluation).

Identified effects of programme

This is an issue that requires consideration, and it is hard to find quantitative data relating to specific programme initiatives. There are usually many factors that influence companies' development and it is hard to distinguish the specific role that a programme played. In addition, there is a certain time period before the effects of major changes can be measured in terms of revenue and profits. However, several programmes conduct continual evaluations of their impact on client companies. In some cases the programmes have as an ambition to follow up metrics such as firm revenues, profitability, and number of jobs (IMP³rove and GrowthAccelerator). But mostly this data is perception-based data of a qualitative nature, sometimes supplemented by some quantitative data. Another kind of data that was used is 'innovation' metrics such as the number of innovative ideas, the value of each idea, time-to-market, and time-to-profit (IMP³rove and Innovation Engineering System). In regards to measuring the value of an idea, this type of metric carries with it a risk of forcing firms to start thinking about business cases perhaps a little too early in the innovation process. This might kill more radical and uncertain innovations that potentially could contribute to long-term high revenue streams and profitability. Finally, activity data (i.e. what the programme has spent its resources accomplishing) was frequently used. This is sometimes done in a very systematic way relating back to the goals of the programme, such as in the case of

Production Leap where goals are in number of awareness seminars conducted, number of participants, and number of locations – and similar statistics on courses given and on coaching hours spent in companies.

When data is compared to a similar group that did not get the support, it can provide some insight into the programme's effectiveness. This was done in the case of CENTRIM and indicated that the participants in Profitnet developed in a better way than other similar companies. However, as organisational innovations typically are implemented in parallel with other changes in a company, effects on firm revenue and profit growth are hard to discern. When all target companies are included in the group that is actively approached, it is considerably harder to evaluate the impact of a programme. In the case of GrowthAccelerator, all high-growth potential companies were selected (26,000) and according to the research referred to by GrowthAccelerator, these companies are the ones that will create most new jobs, regardless of intervention. Thus, although the programme may well contribute by providing marginal input at a certain critical point in time, we will never know this for sure. In addition, for programmes such as GrowthAccelerator and TYKES/Liideri that both provide company specific solutions, i.e. have no specific organisational innovation to disseminate, it is harder to measure and conduct comparisons between firms and programmes.

Finally, it is worth discussing the goals set by GrowthAccelerator (55,000 new jobs and £ 2.8 billion in value growth as a result of the programme). Again, the fact that a change of management practices is not conducted in isolation is a challenge when evaluating whether the programme actually led to all these jobs and high value growth. This might be specifically hard when the firm solutions are all different in the sample. In addition, a change in management practice could be expected to generate results subject to a certain delay in time. For the firms changing in Year One, the result might not be visible until Year Three. But the firms starting their change process in Year Three will most probably not contribute so much to the number of new jobs or value growth, if the overall result is evaluated in the end of Year Three.

What can we learn?

Following up the results from deploying an organisational innovation is naturally challenging. First, it is hard to correlate a single innovation's effect on firm results, as the former is most commonly not deployed in isolation. Second, there is a delay factor that needs to be considered, as most changes in management practices affect the result subject to some delay. Third, in order to evaluate the specific programmes' effect on firm results, it almost obviously requires very fixed conditions in order for the programme co-ordinators and others to learn from the processes and the object selected to create the increased result. As has been previously identified in this report, a programme is, in itself, continuously being refined and improved, which is why the object and processes are also changed over time. This means that a programme's efficiency Year One might differ from its efficiency in Year Three.

Two programmes attempted to measure overall company results, such as new jobs created, and increase in revenue and profit (GrowthAccelerator, IMP³rove). However,

the other programmes focused on activity metrics (showing the activity in the programme), perception metrics (the end-clients' and consultants' perceptions of the results of their respective programmes), and in the case of Innovation Engineering System and IMP³rove, additional innovation metrics (number of innovative ideas in the pipeline, and the value of these and/or time-to-market launch, time-to-profit).

5.5 External context

The external context has influenced the initiation of all seven programmes. For example, the European Commission initiated IMP³rove, although the initial idea was based on a concept developed by a consultancy firm that became one of the drivers of the programme. In the UK, the new government searched for ways to create new jobs by stimulating companies to grow, and invited them to a tender process resulting in the GrowthAccelerator. Often, there are several actors in a society that identify a need and join forces to create a programme. TYKES and Liideri were created through government organisations but were also a result of an insight that Finland needed to compete in the future through a better working life with both labour unions and employers' federations contributing their input in steering committee discussions. Similarly, the Production Leap was initiated by a combination of actors - the Royal Academy of Engineering Sciences commissioning an initial report, a labour union, and an employer organisation – becoming aware of the increased international competition for SMEs and of a solution - to develop Lean Production. Stage-Gate® had also started based on observations of increasing global competition, but by university researchers. CENTRIM's starting point was university researchers' observation of a need for developing Innovation Management in industry and their interest in working in an action-oriented manner in close collaboration with industry. Profitnet was one such case where the initial approach was developed through research funding. The first pilot programme was funded by EC money to help a deprived region, followed by additional UK public funding. The Innovation Engineering System programme, too, has been influenced by various initially external sources, such as universities, experts, and government organisations, such as NIST/MEP.

All programmes, except Stage-Gate®, used and cooperated with existing local resources such as consultants and intermediaries and local governmental agencies. The focus on local resources was explained here as due to the fact that these had the strongest relationship with end-clients. In order to be able to utilise these resources effectively in the programmes, IMP³rove, Innovation Engineering System, and GrowthAccelerator emphasised the importance of training local resources, as these could not be assumed to have necessary knowledge or skills.

What can we learn?

The data indicates that the external environment in form of government vision and policies, competitive threats, and a country's financial situation do influence programmes for disseminating organisational innovations. Further, as the dissemination of organisational innovations requires a focus both on education and on access to physical resources in form of consultants and intermediaries, the institutional set-up and the

competence within this set-up of stakeholders are significant to the dissemination. It can also be of interest to reflect on countries' or regions' history and culture, such as the involvement of labour and employers' organisations in TYKES/Liideri and Production Leap.

6 Match between project findings and a conceptual model

The project has investigated seven programmes, all with the intention of making companies more competitive by introducing and implementing, for the firms, new management practices (here referred to as organisational innovations). Most of the programmes disseminated more or less pre-defined organisational innovations in order to increase the competitiveness of firms. However, in one case, the organisational innovation was not pre-defined by the programme co-ordinator, but the end-client companies instead were referred to well-established practices in finance, marketing, sales and IPR (GrowthAccelerator). In another case, the organisational innovation was to be created and disseminated during the programme's life span (Tykes/Liideri).

Independent of whether or not the organisational innovation was pre-defined or created during the programme's life span, the findings from the seven programmes match very well the theoretical findings presented in Steiber (2012). The external context, such as history, culture and institutional set-up, influences the dissemination of organisational innovations. In addition, the institutional set-up, in itself, is a victim of path dependency and inertia. Diffusion mechanisms identified were universities, consultants, people (managers and other internal change agents), user networks, role models (e.g., large companies applying the new practice), research institutes and industry associations. However, local governmental organisations as well as non-profit organisations also played a role and could be important diffusion channels. It was also found that not only did the national institutional set-up matter, but also the local institutional set-up. In fact, local resources played a crucial role in the dissemination of organisational innovations but these resources need to be educated and trained. The access of local resources and the efficiency of training these were therefore important inter-firm diffusion activities in scalable programmes.

The five steps in the intra-firm diffusion process (desire, feasible, first trial, deploy, and sustain) were all valid and relevant when analysing a programme's design. A potential new step identified was 'contracting', which was found important in some programmes. In the case of intra-firm diffusion steps such as desire and feasible, these were influenced by strategically designed awareness, educational, and training activities of end-users. Further, even if this study didn't include interviews with affected firms directly, it could be assumed that issues such as user competence, inertia, and path dependency on a firm level also affected these steps. For example, in the case of Innovation Engineering, the concept was promoted as new practice that could complement the existing product development process rather than replace it. The concept was divided into four phases, two of which were well known among potential clients. In this way the concept was related to existing user competence, which could reduce the threshold for being accepted. Finally, it was clear that organisational

innovation was not static over time post-deployment but was continuously being refined and changed, triggered by both internal and external factors. Here, one of the programmes (Stage-Gate®) took an active responsibility to update clients with the latest research and with new refined concepts in order to facilitating for the clients to upgrade their product development process.

7 Conclusions

The data from the seven programmes indicated a number of interesting things. First, the programmes were influenced by, and path-dependent on, knowledge and experience from previous programmes. Further, the programmes were, in themselves, organisational innovations that were continuously being refined and re-invented due to learning processes among stakeholders. Programmes for disseminating organisational innovations were also found to require an emphasis on education and training of both end-clients and other target groups such as consultants. This was also obvious in the case of Production Leap in which the innovation 'Lean Production' is well standardised. In the case of Innovation Management, the organisational innovation is less standardised and will therefore need continual adjustment (innovation) and local standardization in each company. Hence, there is a need for education and training that enable local innovation and standardization of the object itself.

A number of issues could have influenced the programmes' specific design and content. Among these issues are the overall purpose, scalability requirements, and the age of the programmes. However, it was also found that external factors, such as government vision and policies, competitive threats, a nation's financial situation, and the local institutional set-up, influence programmes.

Most programmes focused on SMEs because they were thought to be the primary base for growth, while also lacking resources, skills, and finances to conduct change projects by themselves. However, some programmes had also focused on larger corporations and governmental departments, and the data indicates that both these segments act as important diffusion channels to SMEs. Typically, the 'objects' diffused could be viewed as methods and tools for analysis and implementation of the organisational innovation. These methods and tools were surprisingly similar among the programmes with regard to the inter-firm and early phases of intra-firm diffusion processes, with one exception: TYKES/Liideri. Further, the objects were found to be trajectories, rather than static objects.

Great emphasis was generally placed on the conceptualization of the objects, and some of the programmes had invested in protecting them legally by trademarking. Most commonly, the programmes provided some opportunity to observe, test, and even evaluate the new management practice. Some of the programmes had invested in standardised deployment processes, and one of the cases strongly emphasised the development of the object after deployment, which could support the sustainability of the solution. Most programmes had standardised their work methods and tools but provided flexibility in the detailed outlining of the firm solution. The content of the programmes came from either a research-based or practitioner-based solution. However, currently all of the programmes ended up being based on both perspectives.

The organising structure of all programmes starts in a smaller unit of a few partners being responsible for the development of the content and the processes of reaching end-

clients. If the programme is intended to impact many companies, it has to find ways to reach these companies, and this is typically accomplished by working together with local or regional partners who can have direct person-to-person contact with potential end-clients. Some programmes are designed to scale while others are not, even if they have the goal of broad impact. However, sometimes there are parts that could easily be redesigned to scale. There are ways of scaling up through the training of consultants combined with an accreditation process for quality assurance. Most programmes use training combined with accreditation, however, training time differs to a large extent. Almost all programmes used some kind of learning networks with peer-to-peer mechanisms for learning, but the outcome varied considerably. Reasons seem to be the variation in the management of online networks and in the experience and training of facilitators in offline networks. In successful cases, the facilitator of offline networks was considered the key to success, and potential facilitators were selected based on considerable experience in combination with thorough training and accreditation in facilitation. Feedback from clients concerning coaching experiences was also considered an important way for the programme to secure quality.

Most programmes followed a standard design of dissemination steps by first creating an awareness activity, which also served to identify potential candidates. To increase both engagement and competence level, almost all programmes used different kinds of training activities. Some emphasised the strength of visualizing both during the engagement and the deployment phases. Contracting stood out as something that the various programmes valued differently. Two programmes characterised ‘contracting’ to clarify ground rules and mutual demands and expectations as one of the most important factors for success. The impact of interventions in the Innovation Management field is difficult to measure and to analyse. Most programmes are evaluated continually, but the impact in terms of turnover and profit is difficult to link directly to programmes. Instead what is usually measured are programme activity measures in relation to programme goals, innovation measures, or some kind of qualitative data from participants concerning their perceptions of impact on key areas, including culture, strategies, and directly on skills for innovation.

The external world has influenced all programmes, and often served as an important early eye-opener or sometimes more like a persistent lobbyist. In the cases analysed, external influence was based on perceived competitive threats and a view that existing SMEs need support to develop new capabilities and thrive.

Finally, the theoretical model for how organisational innovations are created, diffused, and sustained was valid when analysing the seven programmes. However, the analysis of the seven programmes provided some new aspects that could be useful to consider in future theoretical models. Some examples of these aspects were the emphasis on the ‘contracting’ step in the intra-firm diffusion process and the important role local governmental organisations, non-profit organisations, as well as other ‘connectors’ such as financial advisors and lawyers, could have in the diffusion of organisational innovations.

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Appendix 1 – Terminology

The following are the definitions of some key terms used in this report.

Diffusion

The diffusion of an organisational innovation is defined as the process by which an organisational innovation is perceived as desired and feasible and then trialed, deployed and sustained by firms and organisations in a specific social system. For an organisational innovation to be considered 'deployed', the organisational innovation needs to be diffused to the single firm and then to be used in at least parts of the firm. To be considered sustained, the organisational innovation needs to become a natural part of at least parts of a firm's business practices, workplace organisation or external relations and is thereby affected by further developments of these.

The diffusion process concerns both how and at what speed an organisational innovation is being diffused. Further, diffusion processes can be divided into inter-firm and intra-firm diffusion processes. Inter-firm diffusion processes are processes transferring knowledge and concepts about the innovation to and between firms, while Intra-firm diffusion processes are processes through which the organisational innovation is viewed as feasible, trialed, deployed, and sustained by a firm.

Dissemination

Dissemination of organisational innovations is defined as: planned, systematic efforts to make an organisational innovation more widely diffused among members of a social system.

Organisational innovations

An organisational innovation is here defined as 'an organisational method in the firm's business practices, workplace organisation or external relations that is new to the firm or organisation'. Organisational innovations can be intended to increase a firm's performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus, labour productivity), gaining access to non-tradable assets (such as non-codified external knowledge), improve a firm's innovativeness, and/or reducing cost of supplies. Business practices include organisational elements such as leadership, culture, human resource management, management processes such as business development, performance and incentive systems, mechanisms for learning, and external and internal communication.

Desire

Desire refers here to key stakeholders' (most commonly members of top management team) perception that there is a need to change the organisational method in the firm's business practices, workplace organisation or external relations, that is, there is a need for organisational change. The perception can be influenced by e.g. an economic crisis,

new market demands, or new demands from owners and board. This step in our conceptual model was inspired by the work of Shapero & Sokol (1982).

Feasible

Feasible refers to key stakeholders' perception that the innovation could be suitable and possible to introduce into their specific firm. This perception is influenced by user competence, inertia and path-dependency, but also by access to role model firms, study visits, etc. Also this step was inspired by the work of Shapero & Sokol (1982).

First-Trial

The division between first trial and implementation is made for analytical reasons, in order to distinguish between single trials of the innovation and a more broad-based internal diffusion. To be classified as a single trial means that key stakeholders have still not consciously decided to implement the innovation, only to trial it and learn more about its benefits and potential costs.

Deploy

Deploy an organisational innovation refers here to a conscious decision to implement the innovation on a broader scale. It does not mean that it is immediately implemented in the whole firm but could still be limited to e.g. a business unit or a specific country.

Sustain

Sustain means here that the organisational innovation becomes part of a firm's normal business practices, workplace organisation or external relations. It might continue to diffuse internally to new departments and business units and over time it will be further refined and complemented by other organisational innovations in order to achieve overall firm goal. Most commonly the further development of the management practice is following a certain path-dependent trajectory.

Programme

A programme is defined as an organised system of actors with different roles and responsibilities for diffusing an organisational innovation to and between firms and within a firm. The actors perform a number of activities such as developing a programme strategy, developing tools and methods, and conducting education, training, and follow-up activities.

Firm impact

'Firm Impact' here means 'a change of firm behaviour', which often is a consequence of a change in company leaders' behaviour. The change of behaviour, in turn, can lead to improved revenue and profit streams, or an increased number of jobs.

Eco-system impact

The definition of 'Eco-system Impact' is a changed behaviour within an eco-system. Here the main component to focus on is how the structure of relationships changes, as well as how the depth and intensity of these relationships between different players in

an eco-system (commonly defined by researchers, company leaders and/or governmental organisations) change over time. The programmes that have been evaluated so far and have been interpreted by the project team as creating impact either claim or have proved that they have created firm and/or eco-system impact.

Scalability

The definition of 'scalable programme' is 'the ability for an increasing number of companies or organisations to share and benefit from a single programme'. In an economic context, this implies that the programme's underlying business model offers the potential for growth in the number of companies and other organisations benefitting from the programme. The word *scalable* embeds several dimensions that need to be considered. These include, but are not limited to, coverage of: 'company sizes', 'industries' and 'geographical areas'. In the case of a scalable programme, the programme itself needs to be designed to be scalable, which is why the initial intention becomes important. This does not exclude the possibility that a scalable programme could be developed in several steps, of which the first step might involve a limited sample of companies who together with the programme co-ordinator develop the object and programme design further. In the case of organisational innovations, a resource, such as consultants, appears to play an important role in disseminating a new practice to a company. At the same time this resource is limited and might also need education and training. This means that a scalable programme must effectively train and use this limited resource in a nation or region. In addition, there are other elements that affect the scaling such as labelling and packaging the 'object' and creating an effective and efficient mechanism for co-ordinating the whole programme and all stakeholders. The programmes that have been evaluated so far and have been deemed by the project team as scalable have either proved by facts that they are scalable, or have built a programme based on a clear intention to reach many organisations.

Target group

Target group here means organisations that are targeted by the programme co-ordinators in order to diffuse the organisational innovations. A target group includes both the end-clients that are to implement the new management practice, and organisations acting as important diffusion mechanisms, such as consultants. For a group to be defined as a target group, the programme co-ordinator needs to plan and execute specific activities and offerings towards that specific group.

Innovativeness

In this paper 'innovativeness' is defined as a firm's capability to continuously innovate. Innovativeness includes being successful on the market in launching new products and business models, but it does not necessarily mean that a company needs to be successful in all market launches. No failures could as well indicate risk aversion, and consequently be an indicator of a less innovative firm. Also an ability to learn from mistakes, or to close failed attempts relatively early on, could be a sign of innovativeness (Steiber & Alänge, 2013).

Appendix 2 - Qualitative data in tables

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
Overall observations of the programme as an organisational innovation				
Programme as an organisational innovation	The programme was initiated in 2005. The programme was influenced by clear ideas from initiator, on an overview of best practice in 2006, on learning from The Best Innovator Contest managed by ATKearney. The programmes have been a continuous learning process since first trials in 2007.	The idea behind the programme was initiated in early 80s and then explored at P&G and later at other larger corporations through consultancy. The programme was formed in early 2000 and was a result of opportunities due to external factors. The programme has since evolved through a continuous learning process.	The idea behind Stage-Gate® was developed in 1986. The programme has since developed from more or less single consultancy to a three pillar approach (Center for developing, commercial organisation, third parties) and clear, standardised tools and methods.	TYKES and Liideri are a result of a government vision, national challenges, and a positive experience from previous programmes. The programmes follow a clear trajectory.
Main diffusion mechanisms to reach end-client group	A system approach. Mechanisms are a consortium of ten partners, trained consultants, intermediaries, universities, policy makers/innovation agencies, European standardisation activities, IMP³rove's own IT platform, and other EC-initiatives.	A Triple helix approach. Mechanisms are IEI (cooperation between University of Maine and Eureka!Ranch), NIST/MEP, local universities, government and not for profit organisations.	Well- known books, scientific papers, conferences and seminars. Also user network of large corporations, Product Development and Management Association, Awards, in-house marketing/sales organisation, and Partner SW sales.	Teke's own staff, consultants, researchers, research institutes, labour/employer organisations, and specific learning networks
Characteristics influencing programme overall				
Purpose	To provide better support in Innovation Management for SMEs by providing a holistic approach to Innovation Management.	The purpose is to help organisations reignite a culture of innovation by transforming their mindset through a systematic approach to product innovation.	Introduce a systematic and later holistic approach to product innovation.	Increase work life quality and productivity /innovation by tailored and demand-based activities that significantly accelerate workplace level development of productivity/innovation and quality of working life, and support research and development expertise.
Primary initiator	European Commission, DG Enterprise and Industry.	An individual (Dough Hall) who was inspired by Nashua Corporation in early 80s and later Dough Hall together with University of Maine.	Dr. Cooper and later Dr. Edgett from McMaster University	Government as part of employment policy and later of employment and the economy policy.
Size of funding	Not disclosed.	Not funded directly by government.	Not funded by government.	EUR 75 million (TYKES) 57 million for developing projects (996 projects) which equals EUR 57,229 per project (or in SEK 526,500/ project)* 10.4 million method development projects (25) 7.6 million for learning network projects (16)
Programme age	8 years.	Idea initiated 30 years ago. First part of programme (curriculum) launched eight years ago, with NIST/MEP, three years ago.	27 years.	Previous programmes started already in 1993 (20 years ago). TYKES started in 2004-2010 (nine years ago) and Liideri started in 2012 (one year ago).

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
Initial requests on the programme	To become the European model for Innovation Management for SMEs. Develop Innovation Management capabilities in Europe at SMEs and at Innovation Management support service providers	To substitute current Entrepreneurship programmes (new curriculum). With NIST/MEP- support manufacturing SMEs with innovation engineering.	Support North American business to become faster and more efficient product innovators.	Strengthen Finland's competitiveness by disseminating generative ideas as sources of encouraging, inspiration and learning for workplaces and stakeholders in the Finnish private and public sectors.
Target group and characteristics of object				
End-client group	Primarily European SMEs (also used outside Europe). From 0-999 employees in any industry. Future, expand target group to 1,000+ companies.	Universities/colleges. Manufacturing SMEs. Large corporations. Governmental, ministries.	Companies of any size across all industries (mostly in NA)	Growth-oriented SMEs. In the case of Liideri 'SMEs that pursue growth from innovation-derived competitive edge' in their business activities.
Logic for choice of end-client	EC philosophy: majority of growth in number of jobs come from and through SMEs.	External factors and secure future change agents (university/ colleges). NIST/MEP mission (manufacturing SMEs). Historical track record and experience (Large corporations). Governmental departments (as market and support channels to local SMEs).	Every company can benefit from a more systematic approach to product innovation.	SMEs have weaker competitive opportunities in skilled labour and don't have similar financial or expert resources available for the development of modes of operation. Growth-oriented SMES is also Tekes main target group.
Other target groups	Local Innovation Management service providers (e.g. consultants and intermediaries). Financial providers. Policy makers/innovation agencies.	Local, existing infrastructure (Universities/Colleges Local government, non for profit organisations, local companies). NIST/MEP.	Software partners providing quality assured product innovation software.	Labour market organisations. Employment and the Finance Ministry. Working Life researchers. Local consultants. Research Institutes
Logic for choice of other target groups	Innovation Management Service providers: providers of IM services. Financial actors and policy makers: influencers on SMEs.	Local existing infrastructure assumed important for dissemination of IE. Strong belief in collaboration between university, government and private sector.	Software automation solutions needed for implementing Stage-Gate® best practice processes such as Idea management, Idea-to-launch process and portfolio management.	Means for increasing workplace level development and research within the area.
What is the object	The end goal is a holistic approach to Innovation Management. The objects diffused are standardised 'tools' such as assessment, benchmark, and an Insight report and standardised methods such as 'facilitated workshop' and 'high level consultancy process'. It is also non-standardised tools and methods used by the single consultant. In addition, a standardised curriculum and method on how to train and certify consultants is used.	The end goal is systematic approach to product innovation. The objects diffused are: Skills and standardised tools and methods for education/training of change agent For deployment and sustainability of IE- tools and methods on an IT platform. A standardised curriculum for universities and colleges.	A conceptual and operational roadmap for moving a new product project from idea to launch. The objects diffused are tools and methods in form of products and consultancy services together with a one-way knowledge community.	No specific object. Programme was to develop new organisational innovations that met set goals. The focus was on disseminating generative ideas.
Is the object static or a trajectory of re-inventions?	The different objects are all trajectories along which they have been developed over time	The different objects are all trajectories along which they have been developed over time.	The object Stage-Gate® process could be viewed as a trajectory towards a systematic and best practice approach to product innovation. The object has also been complemented with three other into Innovation Diamond™ framework for innovation.	No data. It could be assumed that each new method or tool is further developed over time.

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
Emphasis on conceptualisation and IPR	High. In addition, branding of IMP³rove has been emphasised.	High. It is believed to be important for the clients to have "*something to hold onto*". There is also a strong belief in having a commercial sound business model behind the programme.	High. The emphasis on conceptualisation and IPR is high. The concept is trademarked and branded.	Low.
Emphasis on making the object easy to observe, trial, and evaluate	High level of emphasis on making the framework for Innovation Management easy to observe and understand. The Insight report together with the benchmark, are tools that can create a desire to change- and also a sense of feasibility. No specific offering has been identified for clients to trial parts of or whole framework of management practices Benefit evaluation is mainly done through the referral to Growth Champions and by using a follow up assessment.	High emphasis on simplifying both communication and solutions. Specific offerings developed to observe, trial and evaluate the tools and methods (Leadership Institute and Jump start programme). Trials and evaluation possible through deployment process (Waved approach)	High emphasis on observability. Observation and evaluations are possible through seminars, educational material and specific products such as Innovation performance assessment and Benchmarker, available on the online platform. The possibility to trial the new way is not clear. Trials might be done in services such as 'Training and development Solutions'.	Low. Emphasis was on creating new organisational innovations. In addition, observation and evaluations were difficult, as the methods and tools used differed among companies, learning projects and research projects. Some observation was possible through research papers, conference, and web page information. As the programme was experimental, trial was a natural part in developing new practices.
Standardised or tailored tools and methods	Standardised in early phases of the dissemination process. Tailored and therefore less standardised in phases such as deployment and sustainability of the OI.	High degree of standardisation of curriculum, education/training programme of change agents, deployment process. Pace of deployment dependent on company's leadership, history etc. Standardised as a complement rather than a substitute to existing processes.	High degree of standardisation of products and consultancy services. But company-specific solutions are desired.	Tailored to individual firm's need, or researcher's focus area.
Importance of IT platform	High. The IT platform provides online assessment and benchmark tool, research, learning network, and IMP³rove Academy	High. IT platform provides tools and methods used on a daily basis, blog, learning network (incl. an open community).	High. IT platform provides products & services, information about seminars, knowledge, and a one-way knowledge community.	Low. Only the use of Internet was mentioned.
Research or practitioner based	Mostly practitioner based but with components based on research	Both. Based on Deming's work in the quality area and several years of work in corporations.	Both. Research based and developed through real deployments and learning from clients.	Research and practitioner based.

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
Characteristics of programme				
Primary set-up of inter-firm and intra-firm dissemination systems	Inter-firm: Well-standardised approach. Allow for local differences. Main global partners (AT Kearney and Fraunhofer-IAO) and eight national partners that co-ordinate local stakeholders such as consultants, intermediaries, financial actors and policy makers. In addition, strong partner in SW solutions Intra-firm: Less standardised. Global co-ordinators provide a generic Innovation Management consultancy process and provides non-standardised tools and methods on IT platform In addition, dissemination through online learning network	Inter-firm: Well-standardised approach. Allows for local differences. Main partners: Eureka! Ranch (private company) and University of Maine (IEI). The IEI develops curriculums, methods and tools for training and arrange the Leadership Institute. They also act as certification body. The IEI works with US government in supporting education and building an online National Innovation Marketplace. They also co-operate with NIST/MEP with 1300 advisors that reach out to manufacturing SMEs and with local government and universities/colleges. Finally, they also cooperate with 'connectors' (lawyers, accountants etc.) with an existing relations with local companies and their CEOs Intra-firm: Well standardised and driven by trained change agents, supported by IT platform and learning network. Change agents are trained in engaging potential clients and trialing and deploying the solution through a Wave approach.	Inter-firm: Well-standardised three pillar approach. Product Development Institute, Stage-Gate® International and third parties (currently 7 SW partners). Inter-firm: Well-standardised approaches. Driven by Stage-Gate® consultants.	Inter-firm: Loosely standardised. Formal project organisation run by Tekes. Decentralisation of engagement, education, trials and deployment to other stakeholders such as researchers, research institutes, consultants and labour/employer organisations. Intra-firm: Not standardised. Firm specific and dependent on specific influence from researcher and local consultants.
Sub-processes in the inter-firm and intra-firm diffusion systems				
Contracting/Training/ Quality assurance of target groups used as diffusion mechanisms to and within end-client organization	Contracting/Training: Consultants and intermediaries succeeding in training/exams are contracted as IMP³rove coaches or consultants. The education is a step-by-step process based on two-day training modules, building up competence in Innovation Management. Quality Assurance: Certification process. No information on any re-certification process. Feedback from SMEs and consultants after assignments.	Contracting/Training: The programme invests a lot in training 'change agents', who exist within companies, universities/colleges and governmental agencies. Change agents are trained for 18 months (now 3-6 months) according to a standardised method 'Cycles to Mastery'. When certified they become Black Belts in IE and are by that part of the Black Belt community. Quality Assurance: Certification process. Real time data on IT platform on e.g. Black Belts performance.	Contracting/Training: No investment in training other consultants. Third parties are certified through a three-step process. If their software lives up to 200 criteria, submits proof on installation and demonstrates ongoing achievements they are certified to Stage-Gate® Ready vendor. Quality Assurance: By third parties through the certification process and a re-certification process (every two years).	Contracting/Training: There was no training of either consultants or researchers. The contracting was affected by consultants' résumé (screened by Tekes), researchers experience and focus area (Screened by Tekes) and firm requirements (decided by the firm and required to be aligned with Tekes criteria). Quality Assurance: Résumé of consultants Experience and focus area of researchers.

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
To end-clients: Awareness/ Contracting/Education/ Trial/Deployment/ Sustainability	Awareness: Promoted through other EC initiatives, through IMP³rove web page and reports, and through viral marketing created by national partners and certified innovation service vendors. Also financial actors and policy makers are supposed to inform and make SMEs aware about IMP³rove. Contracting: No information. Education: primarily done through innovation service providers that support SMEs in assessment, interpreting benchmark, and facilitated workshop. Trial: No information. Deployment: Gaps are identified in assessment and benchmark. Overall Innovation Management consultancy method exists otherwise deployment is influenced and set by single consultancy firm and the SME. Sustainability: Sustainability through new research and IMP³rove community. In addition, re-assessment offered 12 months after the first one.	Awareness: Promoted through universities/ colleges, NIST/MEP advisors, and change agents at large corporations. In 2013, they will however build a scalable system for awareness building. Contracting: Leadership engagement is thought to be key. Further, employee' characteristics are tested in order to see if they are early adopters or not. Firm cultural assessment can also be conducted. Education: Advisors/ Change agents are trained in engaging clients and deploying solution. The belief is that face-to-face meeting with leadership is crucial in order to create insight and present the USP with IE. IEI educate leaders, e.g. through the Leadership Institute (three days) and the 'Jump Start' programme (less than three months). Also the deployment process is built up around education and training- building confidence among leaders. Trial: Through Leadership Institute but mainly through Jump Start programme. Also the process for deployment is built on Waves, where each wave involves a smaller group of employees, a narrow focus area, is experimental and short in time (three months). The reasons are for them to trial and to show result and get insights/change mindset. Deployment: The Wave approach is used. A number of three months, low risk and low stress experiments called 'innovation waves' are conducted. The first wave of team members is identified with an "*Innovation change agent identifier*". Each wave of employees is trained to be 'green belts'. After some waves, management feels confident that this is the way forward. The pace for each firm differs and depends on its leadership. Sustainability: Training of change agents, confidence among leaders, IT platform.	Awareness: Promoted through books, research papers, white papers, seminars, conferences and viral marketing. Contracting: Through a normal' consultancy sales process. The software providers contract the client in regards to their software but not in regards to the Stage-Gate® process. Education: Through seminars, conferences, books and white papers. Also through training programmes focused on organisation-team-individual. Trial: No data. Deployment: Each service has its own deployment process, e.g. Assess-Implement-Improve or Assess & Align- Facilitate development-Communicate and implement. The first 90-days are thought to be crucial. In this phase, expertise, facilitation and education are provided. Both designing and implementation of the process are believed to be important. In this step 'designing' five ways to communicate are emphasised: make it visual, tell a story, make it accessible, make it valuable and confirm expectations. Sustainability: Improve implemented solution is expected for optimal capacity and delivery of results according to target. Stage-Gate® International emphasis a strong relationship with the client and also offers advice on how to fine-tune and develop the Stage-Gate® process through distribution of knowledge.	Awareness: Was managed by the project team or industry branches at Tekes. Contracting: The contracting was part of the application process. The company, researcher or learning network needed to fulfil certain broad criteria. Education: Was handled by the consultant/ researcher and through the awareness activities from Tekes. Trial: The trial was a natural part of the programme. Deployment: The projects under TYKES lasted typically from 1-3 years. No data on specific deployment approaches. Approaches differed due to firm's needs and consultant/ researcher's field of expertise. Sustainability: The 1-3 years was intended to pave the way for long-term deployment and sustainability. Evaluations conducted by Tekes after finalization of projects.

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
Degree of standardisation of different steps in the dissemination processes	Standardisation primarily of inter-firm diffusion system and of early steps in intra-firm diffusion system.	Standardisation of inter-firm and intra-firm diffusion systems.	Standardisation of inter-firm and intra-firm diffusion systems.	Some standardisation of inter-firm diffusion.
IT support in dissemination	IT is actively used in both inter-firm and intra-firm diffusion systems. However, IT is used to a rather limited extent in later steps of the intra-firm diffusion system. Further, the whole system is also automatic and each activity triggers next one.	IT is actively used in both inter-firm and intra-firm diffusion systems. IT is actively used also in later steps in the intra-firm diffusion process.	IT is actively used in informing and distributing Stage-Gate® International's offerings and white papers. It does not seem to be used in day-to-day deployment of the solution.	Low. Only Internet as a storage and promotion channel was mentioned.
Scalability of programme	The programme is built for scalability. Global organisation develops tools, methods and certifies providers. Innovation Management providers provide the services. Financial actors and government organisations inform and request Innovation Management. The idea is to create a self- driven eco-system around IMP³rove.	The programme is built to be scalable. IEI's own staff is kept to just a core staff and focus on the overall system. The primary role is to develop and deliver tools and methods, and train and certify change agents to be able and have the confidence to help companies and organisations in need for increased innovativeness. A lot of emphasis in 2012 was on making training/certification process more efficient and scalable.	There are 'scalable parts' of the programme such as the dissemination of well-standardised products and services. The programme in itself, however, is not built to scale- if not through more own consultants.	The aim was nation-wide. The programme was limited in scalability as it was designed as experimentation with few common elements. The scalable part of the programme was the administrative processes run by Tekes.
Metrics used by, and effects, of programme	The KPIs referred to are on a programme level and on a firm level (revenue, profit and number of employees) down to single process KPIs (e.g. time for profit for new product). The effects were evaluated based on perception among target groups and on activity, (e.g. number of trained consultants). The effects identified were on activity, e.g. 3500 SMEs and 500 Guides and on perception, e.g. 77% of guides thought the assessment helped in identifying strengths and weaknesses and 74% of SME thought recommendations from IMP³rove experts has a significant long-term impact on their business.	The metrics have been on 'activity', educational and innovation metrics. Effects on activity are that 3,000 companies have applied IES and that 300 (400?) change agents have been trained or that there are 70,000 engagements each month via innovationengineeringlabs .com. Effects on innovation metrics is 4.1 billion worth of ideas in the innovation engineering labs portal and that there has been 250% improvement in innovation success curve.	Metrics and effects are not disclosed. One metric used is number of companies that apply Stage-Gate® process (penetration) and according to market surveys, most Fortune 1000 have adopted Stage-Gate®.	Metrics were on four levels: workplace level, generative level, programme level, and public policy level. The effects, according to a self- questionnaire to companies 80% of the respondents said that the project succeeded well in realising its aims, using its experts and applying its methods. Around 75% of management reported positive effects on labour productivity. However it was unclear if the result was an effect of the project. The dissemination of research more effective than for learning between companies.
External context				
Triggers/Influencers	EC policy decision to improve European SMEs competitiveness through Innovation Management.	The influence of Deming's work on Dough Hall. Universities and experts such as Kauffman Foundation were dissatisfied with current entrepreneurship programmes.	In the first half of the 80s in NA, fast growth of Japanese competitors and stagflation.	Preceding programmes had a positive effect as well as the rapid demographic change.

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
Lessons learned				
End-client group	The end-client group need to include larger company. SME under 50 employees are not as open to Innovation Management services. SMEs of 15 years of age are less agile. Mature and small companies (>15 years but <100 employees) show slower growth rate.	Best return on governmental spending is from investment in companies with more than 100 employees. Age, number of patents and company size correlates to their mindset- reactive or proactive to be innovative.	No data. However, the target seems to be larger corporations with HQ in NA.	Scope down to a more limited target group.
Other target groups	The market for Innovation Management is fragmented. The local channels are diverse and reflect national and regional differences Current infrastructure or channels had to be educated and trained as knowledge is limited No certified auditor due to the significant investment in time required to reach practical experience.	A Triple Helix approach is good. But there has to be a common understanding and willingness to test and learn over time in order to continuously improve the design of the programme and the object.	No data. However only 7 software companies have been certified as third party vendors.	Skills of consultants as well as projects timetable important. Participation by both the employer and employee side in governmental-supported workplace development at both programme and project level increased effectiveness of measures taken. Learning networks driven by researchers, focused more on the researcher's PhD than workplaces learning processes.
Object	An online assessment by itself doesn't provide any real impact. It needs to be supported by education and facilitation on how to interpret results. The IT platform needs a lot of investment in order to be user friendly and contribute with value to the members.	Needs to be packaged, and it needs to be really simple to understand, both for clients and consultants.	A holistic approach to product innovation required further development into the Innovation Diamond™ framework. Last part included was Culture and Leadership. New organisational innovations such as Agile development and Lean Production could complement own solution.	More packaging of result needed. The evaluation of learning networks was hard due to different approaches and an inability to translate the concepts and operating methods of a learning network into more practically oriented language.

Topic	IMP³rove	Innovation Engineering System	Stage-Gate®	Tekes Tykes/Liideri
Inter-firm and Intra-firm diffusion	Innovation Management is hard to sell which is why in some cases public funding acted as an important diffusion mechanism. In addition, face-to-face interaction and long-term relationship building proved to be important as well as education of both SMEs and consultants/ intermediaries Publicly supported organisations and intermediaries became more active in the area of Innovation Management consultancy compared to private organisations. Customizing support services to clients and to ensuring the consultants' capabilities in complex problem solving and value delivery were found as important. The portfolio of services offered by the consultants was found to be broad and diversified and could include advice regarding Innovation Management, innovation enablers such as HR, KM, IT to general management consulting.	It is hard to sell innovation. It is especially hard when the company is on their downward side of their life cycle. Focus must be on education initially rather than selling the idea. Focus on the proactive first (valid for both clients and advisors). Create momentum by creating success and small communities of people that love it. Together with these people, you develop the concept further. Be patient and focus on people that are committed for a long time.	Rather high investment in QA of SW providers. Companies actively improve and develop their Stage-Gate® processes post deployment.	The programme did not succeed as expected in producing platforms for disseminating expertise, specifically between companies. Dissemination of results requires networking and events realised by the programme as well as by the learning networks' co-ordinators. The intention was to make the tool kit simple and concrete and to support the adoption of this. However, it was found that it was difficult for the programme to supervise this comprehensively. Projects more successful in improving supporting services than of organisation of work as such. The success of the projects has been most modest concerning employment relations and the state of development cooperation between management and personnel in workplaces. Broad participation of employees and a genuine dialogue between management and employees are important. Commitment of management was highlighted. Effects of learning networks are hard to evaluate as different methods were used. Also learning networks that were separated from each other did little co-operation and benchmarking.
External environment	Governmentally initiated initiative rather than a market initiative. Public funding important mechanism for increased adoption rate. Local institutional set-up has low knowledge of Innovation Management and need training Impact on industry structure where public organisations are more active than private ones.	Adjust the local solution after local conditions such as skills, political issues, funding, and capacity.	A need to consider new organisational innovations such as Open Innovation, Lean Production/ product development, and agile development.	Hard to evaluate whether the result was based on project or on other projects carried out during the same time.

Topic	CENTRIM	GrowthAccelerator	Production Leap
Overall observations of the programme as an organisational innovation			
Programme as an organisational innovation	The predecessor to CENTRIM started in 1987 and in 1990 the centre was re-branded as CENTRIM. CENTRIM's offerings have developed over time based on government funders' policy and segmental needs.	The GrowthAccelerator was designed based on predecessors (regional growth programmes) in the UK with 10 years of experience. GrowthAccelerator was initiated in 2012 and is a three year programme to boast potential high growth companies in England. The programme is developed based on lessons learned from regional growth programmes and on infrastructure already developed.	The programme has existed in several phases and is now into a third phase. Each Phase Is developed based on lessons learned from preceding phases. Lessons learned have also come from the research community on Lean Production. Increased standardisation of tools and methods has been identified over the programme's life span.
Main diffusion mechanisms to reach end-client group	CENTRIM as organisation, certified consultants, Proftnet's (learning networks), online platform.	Four main partners with regional responsibility, intermediaries such as chambers of commerce, local actors such as consultants belonging to GrowthAccelerator's pool of 1,000 coaches. GrowthAccelerator does central marketing about the programme and analyses official statistics to identify potential high growth companies through their official accounts for the past three years. Based on these analyses, contacts are made with companies. There is also a possibility for presumptive clients to contact the GrowthAccelerator in order to enquire about the programme and tell about their interest in participating.	SWEREA- IVF as main organisation, Chalmers as educational co-ordinator, local actors such as regional universities that can facilitate and arrange activities and consultants. In addition, the parties at the labour market, i.e. both representatives for the employer's federation (Teknikföretagen) and labour unions are involved.
Characteristics influencing programme overall			
Purpose	Offer tried-and-tested resources that help organisations to create new value though innovation.	Create 55,000 jobs and a value growth of £ 2.8 billion by accelerating the growth of England's 26,000 most promising potential high growth companies.	To improve manufacturing companies' competitiveness through increased production capability and to develop companies' ability to produce efficiently and with continuous improvements.
Primary initiator	University of Brighton with founding members John Bessant and Howard Rush.	UK government and consortium of four experienced consultancy firms.	An IVA report "*Made in Sweden – production as power for competitiveness*" in 2004, where the conclusion was that Swedish SMEs had a considerable potential for improved productivity.
Size of funding	CENTRIM mainly receives funding from public sources, through several licensing models and its own consultancy services. The Profitnet development period 2004-2008 was funded by public investment of £ 2,175 million and reached 440 companies. Today the public funding for an 18 month learning network is £ 891 per firm (or SEK 9,400 per firm)* for standard, and £ 1,566 (or SEK 16,600) per firm for ProfitnetPlus	Public funding from BTS £ 180 million and additional funding from private sources. Total funding £ 300 million 2012-14. The public investment would be £ 6,923 (or SEK 73,400)* per firm if all 26,000 firm targeted are included. If EC funds would be added, it would be a bit higher. Total investment £ 300 billion translates into £ 11,538 per firm (or SEK 122,000 /firm)* incl. both EC and private funding	Public funding SEK 113 million 2007-12. Total funding SEK 143 million. For Phase 1, the public investment was SEK 61 million (i.e. around one million SEK per company participating). For Phase 2, the public investment was SEK 57 million and the goal was to have 80 companies participating, which means around SEK 0.7 million per company.
Programme age	Eight years – The Profitnet programme started in 2004 25 years – CENTRIM as an organisation	One year – launched in Jan. 2012	Six years – in two programmes, generation 1 in 2007-2009 and generation 2 in 2010-2012. Third generation has now started.

Topic	CENTRIM	GrowthAccelerator	Production Leap
Initial requests on the programme	Mission: "*to consistently develop new knowledge and understanding of how innovation works in practice*." The goal is "*to work with partners in industry, government and other organisations to provide exciting new insights into innovation dynamics — and to help improve the innovation performance of organisations*." This is done by not only developing new concepts and theories to explain innovation, but also by generating the data needed to test the new theories. A subgoal was to increase the linkages between industry and university.	Creation of 55,000 new jobs and a value growth of £ 2.8 billion by supporting 26,000 potential high growth companies of all types and in all sectors of the economy.	Increase competitiveness in existing manufacturing SMEs by developing their production competence according to a Lean Production philosophy.
Target group and characteristics of object			
End-client group	The services target both companies and consultants.	'Potential high growth SMEs' registered in England, employing less than 250 people and with a turnover less than £ 40 million. Potential high growth companies are defined as companies that have grown between 10-20% over the past three years and that have leadership capabilities to grow.	SMEs with 30-250 employees (in special cases up to 500), operating in the traditional manufacturing industry. The Production Leap concentrates on existing medium sized companies – not on start-ups.
Logic for choice of end-client	The underlying philosophy is that it is possible to develop all kinds of companies through powerful and systematic intervention. Initially focused on deprived UK regions, i.e. to develop companies that from the start were in a worse condition than the average UK company. Consultants: create a scaling effect.	The selection is based on research of characteristics of companies that create new jobs. According to a UK study (NESTA, 2011), 6% of all SMEs generate 54% of all new jobs. A 'high growth company' is one that has grown by more than 20% per year during a three-year period. Further characteristics of high growth SMEs are that 70% are > 5 years and have leadership capability in terms of qualifications, previous corporate experience, a growth ambition, and a robust growth strategy.	Large companies create their own change processes but SMEs cannot do this on their own.
Other target groups	Skilled facilitators to Profitnet. Companies and consultants outside of the UK, such as in Latin America and Africa.	Partners like IOD Growth managers Growth coaches- pool of 1,000	A national infrastructure of universities, applied research institutes, industry, and local consultants.
Logic for choice of other target groups	That the same approach to developing local consultants is working in other parts of the world as well.		In order to sustain change there is a need to have a national eco-system and local support.
What is the object	The end goal is improved Innovation Management. The objects diffused are tools and methods, such as audits, consultancy services and a structured process to create peer-to-peer learning networks (Profitnet). The programme also includes a training/certification and re-certification process.	End goal is to groom companies in order to grow faster. The object diffused is a standardised analysis tool and method to identify what hinders growth in each individual client company and then to develop a firm-specific action plan for growth – followed by a limited consultancy (7-15 days) during a period of 6-12 months. The programme also includes a standardised training/ quality assurance of coaches.	The end goal is to improve productivity by applying the organisational innovation 'Lean Production', which in itself is composed by many different components. The objects diffused are standardised tools and methods for awareness/ education, training, trial, deployment and sustainability.

Topic	CENTRIM	GrowthAccelerator	Production Leap
Is the object static or a trajectory of re-inventions?	Trajectory. The approach is action research based on the intention of continually developing new knowledge that can be used in to help improve innovation performance in organisations.	Trajectory. GrowthAccelerator and its components are based on learning from earlier regional growth projects in the UK. No evidence that GrowthAccelerator itself is designed as a learning process.	Trajectory. There is a clear learning component in the programme and today there is more structure and more pressure on the client companies to follow the standardised process. Initially it was more about methods and tools, now it is also about company culture and leadership.
Emphasis on conceptualisation and IPR	High emphasis on conceptualisation. Lower emphasis on IPR.	High regarding GrowthAccelerator's tools, such as GrowthMapper. A consistent branding of the programmes stakeholders and tools is also conducted. The work approach at the individual firm, however, is not protected, other than by the individual coach (consultant). There is also no emphasis on collecting lessons learned from methods and tools used at individual firms and try to find best practice.	High conceptualisation of different offerings such as seminars, university course, deployment approach. Limited focus on branding beyond the 'Produktionslyftet' programme name
Emphasis on making the object easy to observe, trial, and evaluate	No data	The use of GrowthMapper and creation of Insight reports aim at highlighting areas for improvement and therefore doing it more observable and easy to evaluate benefits.	Observability, trial and evaluation through awareness seminars, university course and a process with pilot projects inside companies before broader internal dissemination.
Standardised or tailored tools and methods	Well-standardised tools and methods. However, the specific content of learning in Profitnet is based on each individual participant's specific needs and in Profitnet Plus also the input from external sources is shaped on demand from participants.	Well-standardised tools and methods in inter- firm and early Phase In intra-firm diffusion. The GrowthAccelerator follows standardised tools and methods to arrive at an action plan but then continued support is totally dependent on the individual needs of the company.	The Production Leap follows a method that is standardised with a basic content (university course in Lean Production) and workshops/tools that are standardised but the change management strategies are company specific.
Importance of IT platform	Medium. Profitnet learning networks are supported by an on-line community. CENTRIM offers some of its innovation related audit tools and services online.	Medium High. Is used for an on-line tool called GrowthMapper, business linking and mentor platforms.	Low. The project is using an electronic log to follow up progress within each company and this log is used for pulse meetings every other week.
Research or practitioner based	Research-based – with an ambition of creating change in industry and scientific knowledge through action research.	Practitioner-based intervention with participation of many active consultants, but basic ideas based on research on job creation and innovation	Both – practice-based OI delivered through university and research institute involvement together with experienced consultants as coaches
Characteristics of programme			
Primary set-up of inter-firm and intra-firm diffusion systems	Inter-firm: Well-standardised. CENTRIM at the University of Brighton is the main player. In addition to its own consultancy, CENTRIM trains a broader group of consultants that can be certified by CENTRIM to use their products. Intra-firm: Semi-standardised. The firm's own and other consultants are expected to use standardised audits and methods. Data on specific intra-firm sub-processes is however lacking.	Inter-firm: Well- standardised. GrowthAccelerator is the main player. The consortium is led by Grant Thornton UK LLP (financing and lead partner) and comprises Pera (Innovation), Oxford Innovation (financing) and Winning Pitch (growth coaching) as the four leading partners. The consortium is funded by Department for Business Innovations and Skills (BIS) and has a partnership with seven partners, including IOD, The Institute of Directors. To this network are then connected Growth managers and Growth coaches. Intra-firm: Not standardised. Firm specific solutions provided according to Insight report and skills, methods and tools used by local coach.	Inter-firm: Well-standardised. Swerea IVF is the programme co-ordinator. Chalmers is the co-ordinator responsible for education and awareness seminars. Participating partners are: Chalmers, KTH, LTU, Tekniska Högskolan I Jönköping, Mälardalens Högskola, Mittuniversitetet, Högskolan in Gävle, and BTH. In addition, local consultants and local governmental organisations are involved. Intra-firm: Well- standardised method for trials and deployment. How sustainability is secured, there is limited data.

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Sub-processes in the inter-firm and intra-firm diffusion systems			
Contracting/Training/ Quality assurance of target groups used as diffusion mechanisms to and within end-client organization	Contracting/Training: CENTRIM trains and accredits consultants to be able to use the tools they have developed on a broader scale. Quality Assurance: Consultants can become accredited but they lose their accreditation if they don't use the tools at least twice every year. Also internal CENTRIM persons are trained and become accredited to perform programme manager and facilitator roles.	Contracting/Training: The Growth coaches are recruited based on their expertise and when they are new they go through a two-day coaching assessment process. Quality Assurance: All applicants to become GA coaches are evaluated through a two- day coaching assessment process. There is also regular feedback from the clients to the growth mangers about the coaching.	Contracting/Training: All coaches take part of university course and are trained in a standardised way of working. Quality Assurance: University course for coaches. Bi-weekly pulse meeting involving all educators and coaches is the basis both for following up the performance, focusing on actions and sharing information. In addition, the programme arranges two-day reflection meetings twice a year to share experiences between coaches.
To end- clients: Awareness/ Contracting/Education/ Trial/Deployment/Sustainability	Awareness: Discussions with local government and identification of focus groups of firms that could potentially become local ambassadors for recruiting participants to Profitnet. Contracting: Important to establish ground rules for the functioning of learning networks – done with the help of CENTRIM facilitators. Also the mechanisms for confidentiality are introduced. Education: Peer-to-peer learning is the basic approach. Education also as a result of audits and new insights. Trial: No data Deployment: No data on any specific deployment method used after audits. Profitnet- standardised process. Through monthly three hour meetings, all participants share strategies and key issues with other participants, providing feedback resulting in the presenter deciding upon what to accomplish next month. This is followed-up and interrogated by the other participants next month. This process provides feedback from many different perspectives – and opportunities to learn from others' failures and successes. Sustainability: The Profitnet Plus and Profitnet Buddies programmes were designed to support the companies' further development.	Awareness: The programme has been publicly launched and has a website. However, the companies will to large extent be identified through analyses of public annual reports and then contacted by GA. Contracting: No data Education: Clients will be invited to participate in master classes and in workshops in parallel with their work on an individual action plan. Also indicated that there could be opportunities for networking, mentoring and access to peer-to-peer advice. Trial: No data Deployment: In between visits from the Growth coach, the company needs to implement and make changes. Sustainability: The creation of learning networks and mentoring opportunities could provide support to sustain. However, no data about if they will continue after the finish of the initial programme.	Awareness: Created through awareness seminars arranged together with regional actors all over Sweden. Contracting: The contracting of the client companies is a key to success for Production Leap. The contract outlines obligations and what each party can expect from each other. There is a demand for top leaders to actively participate, and even for the Board to make a formal decision. If not signed, the start of a project is postponed. Education: A university course is provided in different locations and in cooperation with regional partners. Trial: Each module is introduced and used within a well-defined area by a pilot group being trained in a standardised work approach. Deployment: The Wave approach. The process starts by developing awareness in the steering committee and they have to develop own goals and strategies. A basic idea is to develop a shared view by producing a booklet on the company's principles. A basic idea is that the company needs to make all new tools and methods introduced its own. After the pilot project, new groups can use the same approach. Sustainability: During the first 10-12 months, the coaches visits the company every second week for workshops and coaching, which also provides a certain pace in development. After a certain time the company takes over the initiative and the coaches visits once a month up to a total of 18 months.

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Degree of standardisation of different steps in the dissemination processes	Inter-firm process standardised. Intra-firm process probably standardised. Profitnet is a highly structured, facilitated and managed programme where the process steps and the structure are standardised but not the content. Data on deployment process after audits is lacking.	Inter-firm process is well standardised. Early steps in intra-firm diffusion process are standardised. The steps until action plan are standardised, but from then on it is an individualised solution.	Inter-firm process well standardised. Intra-firm process well standardised, with a possible exclusion for the step sustainability. Even if the intra-firm process is standardised, the firm-specific change strategy is individual.
IT support in dissemination	Medium. IT platform and active on-line community.	Low. GrowthAccelerator home page primarily a window. They also use online tools.	Low. Used for communication and for follow-up of projects by coaches and educators.
Scalability of programme	CENTRIM has found ways of scaling its offerings both through training and certification of consultants and by using Proftnets.	It is designed to scale through a large group of consultants in order to reach all 26,000 companies estimated belonging to the group of potential high growth SMEs.	The Production Leap is not currently designed to scale. However there is a possibility to scale up this programme.
Metrics used by and Effects of programme	Metrics used are 'activity' and 'perception' metrics. Effects: data from 2006 and 2007 indicated that Profitnet had an impact both on innovation in processes and in the organisation and on the launch of new products and services. The respondents indicated an impact in terms of problem finding & solving skills, new innovation strategies and management/ leadership capabilities. Also an improvement in terms of managing relationships with other organisations had an impact on businesses and this improvement can be an effect of the programme design with learning networks. In the add-on programme Profitnet Plus, 75% of the participants indicated a direct impact on the bottom-line of accessing and using external knowledge (for standard Profitnet, this was 69%) and concerning 'development of new products, processes' 80% of Profitnet Plus reported an impact on the bottom line and this number could also be supported by a 25% profit increase during the recession period in 2008-09 for the Profitnet Plus participants	Metrics used are number of new jobs and value growth in pounds. It is also 'activity' metrics, such as how many of the 26 000 companies have been reached and how many consultants are in the pool. Data of effects not yet available.	Metrics used are mostly 'activity' and 'perception' metrics. Reviewing the three main goals, it is evident that the ambition to arrange seminars all around the country has been a priority in order to create awareness of Lean Production. In Phases 1 and 2 of the programme, 225 seminars have been arranged with 13.300 participants from more than 3.000 companies and in 86 different locations. The course in Lean Production has had in total 1.143 participants 2007-2012. In the Production Leap there is a considerable investment in terms of coaching hours within the framework of the programme. Looking into the number of coaching hours, 25,800 hours was spent during Phase 1, i.e. 430 hours in average. For Phase 2, a total of 17,728 hours in 75 companies was spent, somewhere between 350-400 hours per company. During Phase 1, 57 out of 60 companies finished the 18-month programme.
External context			
Triggers/Influencers	Economic crisis provided initial funding in deprived region.	Earlier growth programmes provided evidence that it could work. New Government industry policy in order to create new jobs.	International threat to SMEs competitiveness mobilised a broad group of stakeholders to take action, including IVA, Teknikföretagen, IF Metall and the funding agencies VINNOVA, KK-stiftelsen and Tillväxtverket teamed up for a joint national programme.

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Lessons learned			
End-client group	Profitnet: There are barriers to sharing when members withhold information or when members acknowledge problems but put the blame on external factors beyond their control.	Important that the management teams in the client companies are buying into the project and view themselves as becoming leaders of a high potential company.	The most important factor for success in a company is the leadership and that they themselves assume the responsibility and do not delegate to someone else. It is important that everyone is striving in the same direction, including both the managing director and the labour union.
Other target groups	Not disclosed.		The company projects provide effects not only on the participating companies, but beyond the companies' borders.
Object	Learning networks have potential to enable acceleration of innovation, but building and operating learning networks effectively is a complex process. Particularly issues around building and sustaining trust within networks, to shape a learning agenda, to convene and co-ordinate without imposing need consideration. Networks that continue over a longer period of time risk getting stale and hence, it was found that there is a need of a 'membership refreshment' policy to deal with this challenge – either providing new external challenge/input or providing new information and learning areas.		Gradually more standardised tools and methods.
Inter-firm and Intra-firm diffusion	Inter-firm processes: Not disclosed. Intra-firm processes: Establishing trust within Proftnet turned out to be a key issue, starting by establishing commitment trust during the initial formation. Competence trust emerges as members provide competent feedback and interact around 'worthwhile' ideas and through this close interaction a companion trust can evolve based on strong personal relationships. For the co-ordination of learning networks it was found that a neutral external intermediary could be an important facilitator overcoming internal conflicts and mistrust – but also function as a neutral broker, meditating cooperation and drawing together disparate interests.		Inter-firm process: Gradually developed approach. Intra-firm process: Gradually more structured process. Today there is more pressure on the participating companies to follow the process. The coaches are returning every second week to make sure that the process is evolving at the company, including making the process more clear for the steering groups. However, there is a variation among coaches where some are more demanding while others are more willing to listen. Three factors identified for success: continuity, an improvement culture and a common work approach. Continuity is of importance both in funding from the financing organisation and in the interest of stakeholder, partners and doers. Improvement culture means that each problem creates opportunities for learning and improvement – and this also includes the work approach within the Production Leap. Finally, the common work approach with standardised methods and structure provide a value and learning opportunities for many participants.

Topic	CENTRIM	GrowthAccelerator	Production Leap
External environment	CENTRIM was founded by the University of Brighton and interacts and was funded by local and national Governments and the EC. Interacts with all kinds of firms and conducts action research.	UK Government issued a call for tenders and initiated a dialogue with the consortium behind GrowthAccelerator	Labour union and employer organisation were initiators based on an analysis commissioned by the Royal Academy of Engineering Sciences

**= In order to facilitate comparison of public investment per company expressed in SEK, the following exchange rates for 2012 have been used: EUR 1 = SEK 8.70 and £ 1 = SEK 10*

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