Existence of negative innovation-gaps affecting innovation performance in two Swedish SMEs.

Mikael Johnsson*

Mälardalens University and Munktell Science Park, Portgatan 3, 633 42
Eskilstuna, Sweden.
E-mail: mikael@munktellsciencepark.se

Helena Karlsson

Mälardalens University and Munktell Science Park, Portgatan 3, 633 42
Eskilstuna, Sweden.
E-mail: helena@munktellsciencepark.se

* Corresponding author

Abstract: This paper aims to achieve a deeper understanding of innovation-gaps, found in a previous study according to innovation-audits made by the authors to this paper. Negative innovation-gap is of interest as they might affect innovation-performance within companies and further on Total innovation management (TIM). TIM is a holistic view of innovation, involving a broad representation of employees and functions for which the innovation-gaps could be crucial. This study was made at two Swedish industrial SMEs, 1170 written questions asked to 18 employees, 12 workshops held with two company-specific-groups and one company-mixed-group with senior management. The major findings were "organisational related innovation-gaps", "individual related innovation-gaps" and several subgroups to both of them, e.g. conflicting incentives and time-related-gaps. The conclusion is to not try to categorise the gaps, but to be aware of them when practicing innovation management, as gaps, when become too big, seems to affect innovation-performance in a negative way.

Keywords: innovation workshop; SME; innovation-gap, innovation management; innovation-gap analysis.

1 Problem

Firms that are innovative are proved to be more successful than non-innovative ones and outperform the non-innovative ones both in terms of growth and financial performance. Facts that have come force SMEs to be repeatedly innovative to maintain their competitive edge in an increasingly globalized and competitive market.

Experience as well as earlier research show that managers in industrial SMEs often approaches innovation in an unholistic way. Innovation is often managed as a traditional product development process concentrating innovation efforts to a few areas and involving only few of the employees, which fragments the innovativeness of the organisation. The lack of an total innovation management (TIM) approach lessens positive effects of innovation and thereby decreases companies competitiveness, revenue and ability to grow (Xu et al, 2006).

A previous study of Karlsson and Johnsson revealed large internal innovation related differences between e.g. individuals as well as positions. Those innovation-gaps complicated innovation management and seemed to have a negative effect on innovation performance (Karlsson and Johnsson, 2010). Why this paper is aiming to contribute by achieving a deeper understanding of innovation-gaps with a negative impact on innovation in the context of management and employees at SME:s.

2 Current understanding

For an organization to be deliberate and repeatedly innovative a conscious innovation management is required (Dobni, 2006) (Tidd and Bessant, 2009) and current research focus on Total Innovation Management (TIM) defined as "innovation by anyone at any time in all processes, among different functions and around the world" (Xu et al, 2006). Resent research stresses the importance of making every employee an active part of the innovation process striving to get employees contributing to innovation by free will (Xu et al, 2006) (Pearson, 2002) (Hallgren, 2009) (Dobni, 2006) and points out the positive and critical effects of a broad representation of functions (Kelly, 2005)

Developing a TIM-oriented organization within a SME includes a change in mind-set within both management and employees towards a more holistic view of innovation, involving a broad representation of employees (Xu et al, 2006). As TIM is about implementing innovation into an organization in a broad

perspective it might lead to change-resistance, well documented in various contexts, often focusing on innovative organizations and corporate entrepreneurship (Hayton, 2003) (Hayton and Kelly, 2006) (Ribeiro-Soriano and Urbano, 20109 (Un, 2010), which is important for the innovation management to address in the learning process which is most effective when practicing "storytelling of successful behaviour" combined with "learning by doing" (Pfeffer, 2000) (Von Hippel and Tyre, 1995) Successfully creation of an innovative organization requires fully support and resources to manage innovation (Tidd and Bessant, 2009) (Hallgren, 2009) (Dobni, 2006) and is created by managers who understands the complexity of individuals and organisations (Backström and Olsson, 2010).

Previous research show a distinctive innovation-gap (gap) between managers and employees, functions and individuals. The gaps indicate differences in e.g. innovation-knowledge, -awareness, -maturity which is central factors in an innovative organization. Innovation-gaps might affect implementation of innovation within organisations as they hinder individual's understanding of purpose and importance of every employees participation. Innovation-gaps also seem to hinder innovation-communication and understanding of innovation related activities. (Karlsson and Johnsson, 2010). A creative organization, according to Backström, is a balance of individuals autonomy and integration, too much integration, compared to autonomy, makes it difficult for individuals to develop their work. On the other side, too much autonomy decreases individuals possibilities to contribute to the whole organization (Backström and Olsson, 2010).

3 Research question

A previous study of Karlsson and Johnsson revealed large internal innovation related differences between e.g. individuals and positions. Those innovation-gaps complicated innovation management and seemed to have a negative effect on innovation performance (Karlsson and Johnsson, 2010). Purpose of this paper is to identify what innovation-gaps can be identified to gain a deeper understanding about those.

Research Question: What negative innovation-related gaps can be identified in the SMEs participating in the study.

4 Design/method/approach

This paper is based on a case study (study) in the beginning of a research project supporting and studying innovation management in Swedish SMEs. The study is the second in a series of three studies. After all the three studies in the series is completed all three studies is planned to be repeated a second time with different companies. The first study in the series is a interview supported audit conducted in order to gain a better understanding of the current state of innovation in the

participating companies. Large internal innovation-related gaps were revealed between e.g. individuals and positions were revealed in that study. This second study was designed to achieve a deeper understanding of existing innovation-gaps. This study focused only on gaps with a negative impact on innovation. The third study will further research innovation management in SMEs.

The case study was conducted at two Swedish industrial SMEs, Company-A and Company-B. Both companies participated in the first study as well. Selection criteria when choosing companies for the study were that they should be in different business located in Eskilstuna, Sweden, having their own production, wanting to develop an more innovative structure in the company and also accepting to share their experience to the other participating company in the study. Company A is one of the world leaders in their niche of components in the car manufacturing industry with global customers. Company B is an electronics design- and consultant company that develops and produces electronic components to be built in other products or electronic systems. They are one of the leading companies at their market in Mälardalen (Stockholm and nearby cities). At company A did 10 out of 65 employees participate and at Company B did 8 out of 38 employees participate.

The study was based on a workshop series in four steps following the four phases of the innovation process model designed by Tidd and Bessant (Tidd and Bessant, 2009). The innovation process consists four major block, named "Search", "Select", "Implement" and "Capture" which also were the main topic for each workshop. The model has been used in both the first and the second study. The model was chosen partly because it is part of a comprehensive theoretical context developed by well-reputed scientists with long experience from academia as well as industry. Partly it was chosen because of its communicability. The simplicity and linearity of the model makes it easier for people who are unaccustomed to work with innovation to embrace the concept of innovation and simplifies the conceptual understanding of innovation (Van de Ven et al, 1999).

The participants of the workshop series were the same persons who had earlier participated in the previous survey based on a interview supported audit (Karlsson and Johnsson, 2010). The Participants represented both management and personnel from different departments within the companies. The CEOs where to choose all participating personnel without any other influence from the authors than the request to get such a broad representation of departments/working areas and functions as possible.

Two company-specific Innovation-steering groups (IS-groups) and a one group of senior management from both companies were formed, based on research of Hallgren (Hallgren, 2009). Group-M consisted senior management from both companies. IS-group-A from Company-A and IS-group-B from Company-B consisted a mix of middle management and employees representing a broad representation of departments from the company, but no senior management.

Each workshop step were first held with Group-M, and then held with each of the IS-groups, one at a time. Each workshop step where held with all three groups within one week. The program at each workshop followed the structure starting with a short introduction to the topic, but no explanations or discussions were held at the introduction. Next phase of the workshop were dedicated to conversations between the researchers and the participants, the topics were planned in advanced, focusing on reflections from the earlier study (Karlsson and Johnsson, 2010), lecturing and examples of best practise formed into questions to be answered and discussed. The researcher acted as facilitators keeping the participants to the subjects. Each workshop were held approximately every fifth week and lasted for, in average, 2 hours.

Data from the workshops were collected through the written questionnaires, notes, audio-recordings and observations. Relevant data from the survey have been translated from Swedish to English. In total 18 out of 103 possible respondents at both companies, answered 20 questions each at 4 different workshops. All respondents were not participating at all four workshop steps depending on working situations, therefore, the number of answers was in total 1170.

Written questionnaires were given to the participants to answer directly after the introduction at every workshop. The questions were open and based on the topic for the workshop. Focus on the questionnaire were at both strategic and operational level, e g (Search workshop) "Who is encouraged/encourages you to search for innovation opportunities?" or (Implement workshop) "How do you cooperate with suppliers when developing new products or services?" Each questionnaire contained a total of 20 questions and required an average of about 30min to answer.

In order to achieve a deeper understanding of the innovations gaps questionnaires were analyzed in two ways. One part was to analyze the questionnaires according to a three-grade scale; "Blanc answer", "Short answer" and "Describing answer". At this part of the analysis less attention was paid on *what* information the answers consisted but *if and how* the participants were answering to discover how the participants were contributing, sharing and engaged in answering the questionnaires. Questionnaires were also analyzed with respect to the content of the written answers.

The audio-recordings were analyzed by listening to them several times, by both authors one by one and together followed by discussions, quoting - and notes-writing, comparing data from managers as well as employees in order to discover divergences. Focus when listening to the audio-recordings were; Discussion content, How the participants were engaged and contributing; How the participants treated each other; How the participants involved others into discussions; How the participants related to innovation and their knowledge abut the innovation process.

5 Findings

Findings from this study are shown in the following order; audio recordings, questionnaires and a comparison between the groups.

The audio recordings were analyzed and put into a table describing an identified gap and how they seem to affect the organisation. The table are supported with selected quotings to stress the connection between different data sources. Participants are treated anonymous when quoted from the audio recordings. Different individuals are separated according to Table 1.

Table 1: Participants on recordings

Researchers	Company A	Company B
R1: Researcher 1	Ap1: participant 1	Bp1: participant 1
R2: Researcher 2	Ap2: participant 2	Bp2: participant 2
	Ap3: participant 3	Bp3: participant 3
	Ap4: participant 4	Bp4: participant 4
	Ap5: participant 5	Bp5: participnat 5
	Ap6: participant 6	
	Ap7: participant 7	

Table 2: Summary of representative findings of organisational gaps, showing characteristics, gaps and possible cause.

Organizational gap		
Gap	**Characteristics**	**Possible cause**
Time related	Differences between long-term ambition and real innovation activities.	Difficulties in making assessments for long-term, often more radical innovation investment.
		Short Return of Investment-horizon.

		Incentives that discourage open searches for Innovation opportunities.
		Difficulties to evaluate ongoing long-term innovation projects of more radical nature increases feeling of risk.
Innovation uniqueness	Differences in ambition for innovation mix and actual innovation activities.	Demands for high billing rate creates priority for customer-initiated projects.
		Difficulties in making assessments for long-term, often more radical innovation investment.
		Short Return of Investment-horizon.
		Difficulties to evaluate ongoing long-term innovation projects of more radical nature increases feeling of risk.
Innovation-area	Differences in ambition to innovate outside the current core area of innovation and actual innovation activities.	Difficulties in assessing risks outside current core area of innovation.
		Uncertainty about how the process works outside the current core innovation-area.

		Low awareness of innovative opportunities outside he current core area of innovation.
		Innovation projects often initiated by established customers.
Function related	Management and employees perceive the same innovation situation differently.	Unclear and inconsistent innovation communications.
		Inadequate follow-up from both management and employees.
		Conflicting incentives
		Managers and employees don't have access to the same information.
	Different degree of participation in innovation activities between various positions.	Different incentives directed to different positions.
		Positions is in varying degree associated with innovation performance by tradition.
		Low awareness of innovative opportunities outside traditional innovation-areas.

Quotings – Time related

R1: Innovation strategies. Develop innovation model. What problems would you meet, you think?

Bp3: The free mind-set might be a problem, everything is time controlled. Our CEO is very time-oriented. That is, time is very important to him. We registrer and fixes. God bless you if you forget to put the time right. Really important to put in the time, not so important what you actually do as long as you are here (at construction dep). No work on own responsibility.

Quotings –Innovation uniqueness, Area of innovation

Bp1: "The problem for us" is that we seldom have new a product to present. We offer the same product all the time. We have a concept, which we try to sell every time. We have very few physical products. We do everything as client assignments. We are not present when the customer decides what to be developed.

Quotings –Function related

R1: I wonder if you. Where could you search for opportunities for what you don't produce today to consciously widen the search for innovation?

Ap6: (Answers) Bring the whole company and spread all over the city, at the gas-stations, garages and Real Estates companies.

Ap2: (Interrupting) We do that all the time.

Ap6: (Continuing) Walk around the Real estates. Is it possible to connect engine-heater? What is the environment like? It might be impossible? How widespread is the problem? Is that the problem? It might be a problem for customers living in apartments or being at work?

Ap2: (Replying) I believe we have this covered.

Ap6: (Continuing) How large percent of the citizens has the opportunity...

Ap3: (Interrupting) Might be so, but how are the conditions tomorrow? Ap2: We're looking at the accessibility for customers to reach the electricity grid. Cause we do electrical heaters, nothing else which keep you looking at the infra structure and the trends of it. What is next in the heavy truck-business? Will it be prohibited to run engines idling on parking lots in Germany? Will there be prohibited to use fuel heaters? Will there be a paying system to swipe your plastic card to get currency? When ill al that happen?

Ap3: That's what I mend. How will it be...

Ap2: (Interrupting Ap3) How is the situation in Russia? Is it legal to have currency outside their houses? Are most citizens living in apartments and do they have access to currency. Are the currency provided to the houses? Our products might not be introduced there yet.

R2: Do you know all this?! You know all this!

Ap2: I have pretty much knowledge about this.

R2: Have you spread this to all the employees within Company A?

Ap1: Weeell. We discuss this sometimes.

Quotings –Conflicting incentives

R1: The idea an important resource. We assume that there is one here. In a practical way. Would it be possible for you to be involved in a group who develops the idea together? Or is an external rescore needed to get thing going? Is the company mature enough to work with innovations?

Bp2: We are two people and need to be four, and we will not be four. And of course we want a group to work with this.

Bp4: There is so much to do, there is not enough time anyway. To think outside the box doesn't exist

Bp2: No, there is no way.

Bp4: This kind of meetings are a stress factor.

Table 3: Summary of representative findings of Individual gaps, showing characteristics, gaps and possible cause.

Individual gap		
Gap	**Characteristics**	**Cause**
Definition	Individual differences in the definition of what innovation means.	No company definition of innovation.
Maturity	Differences in individual innovation- maturity and understanding other innovation process.	Individual differences in experience of innovation activities. The company has no clear innovation culture.
Experience	Differences in individual understanding how to run innovation projects.	Individual differences in experience of innovation activities.

Quotings –Innovation Definition, Maturity and Experience

Ap5: I'm not used to think like this.

Ap1: Exactly, that's the problem you know. It's only Ap2 who is used to this.

R2: I'm saying it again. It really doesn't matter. It's very important that you describe it.

Ap5: But we don't work with this...

It's hard even if you feel that you don't know.

Ap4: I feel completely empty.

Ap7: What did she say, the fragile one?

Ap4. I'm completely empty. I...

Ap5: I must ask something. This about "implement". What did it mean again?

R2: Well, It's the about the whole phase. You have chosen project. Now you have started, prototypes perhaps. Until you launch on the market.

Ap5: Uh-huh.

Ap4: It stands perfectly still in my head. No, but this, today I am not part of the game. Not at all.

R2: It might be easier questions on page 4?

Ap4: I have already gone through all the pages (laughter). No. No. I leave it out here. No, this is not my thing. (yawn)

Table 4: Summary of questionnaire answers .

Group	Answer	WS1, Search	WS2, Select	WS3, Implement	WS4, Capture
		% (n=40)	% (n=40)	% (n=40)	% (n=20)
Ma	Blanc	10	20	10	0
	Short	88	63	40	95
	Descriptive	3	18	50	5
		% (n=120)	% (n=108)	% (n=140)	% (n=144)
A	Blanc	22	27	40	56
	Short	69	58	43	31
	Descriptive	9	15	17	13
		% (n=20)	% (n=40)	% (n=40)	% (n=39)
Mb	Blanc	0	33	13	23
	Short	75	43	33	28
	Descriptive	25	25	55	49
		% (n=120)	% (n=98)	% (n=100)	% (n=79)

B	Blanc	8	35	10	8
	Short	83	37	40	57
	Descriptive	10	29	50	35

Significant findings for IS-group-A is that the number of "Blanc answer" increases for every workshop and the "Short answers" decreases for every workshop. All groups have most "Blanc Answers" in the second (Select) workshop, except for IS-group-A who has most "Blanc answers" in the last (Capture) one. All groups have most "Short Answers" in the first (Search) workshop, except for Manager Company A who has most "Short answers" in the last (Capture) one. Both Managers and employees at Company B tend to answer quite the same. In company A, managers and employees have a significant differ in their answers, especially in the third (implement) and forth (Capture) workshop.

Group-M was in overall engaged in the workshops ensuring the importance of implementing innovation but more focused on innovation-tools and structure than implementing an innovation mind-set. Innovation was often associated with technical product-development. Management from both companies were open-minded and sharing experience with each other. Management from Company A was describing their organization as difficult to lead as the senior management had been frequently changed almost every second year, which has affected the employees at Company A to be sceptical to senior management. Management from Company B was very confident in "knowing" what innovation was and how to incorporate innovation into their company, only missing some complementary innovation-tools to their LEAN-focused organization, as everyone was told to look for opportunities for innovation.

IS-group-A was both engaged but at the same time negative to the workshop series. Resistance took action by being rude to each other and the researchers. They were also ignorant, silent, criticizing workshops for being time-consuming, not answering questionnaires, arguing for not participating because "they didn't work with R&D". Over time the resistance diminished radically, innovation-gaps decreased and the participants became engaged, enthusiastic, supportive, contributing and understanding their role in a more innovative organization in the future.

IS-group-B was at all time positive to innovation as well as to the workshops but so unwilling to do "wrong" that it hindered them in answering the questionnaires and participating in discussions. The participants were very focused on time reporting and pointed out low billability as a stress-factor in the early stages of innovation. At the last (capture) workshop the participants started to open up for more open thinking, suggesting new possible projects to start by their own.

6 Contribution

The major contribution of the this study was a deeper understanding of innovation gaps within the participating SME:s. Common to those gaps found is that they fragment the company's innovation structure and thus impedes innovation management.

According to what seems to be the characteristics of those gaps found, the authors have choose to divide these into two major groups of innovation related gaps; Organisational related innovation-gaps (organisational gaps) and Individual related innovation-gaps (individual gaps).

Organisational innovation-gaps is characterised by differences caused by organisational related reasons. As differences between individuals caused by the positions they hold, organisational innovation structure, innovation management or differences in organisational aims and actual actions.

Individual related innovation-gaps is characterised by differences between individuals independent of what positions these individuals holds, organisational innovation structure and innovation management even though those gaps probably could be bridged if those lacks of organisational factors were strengthen.

It was possible to identify a large number of subgroups of innovation gaps belonging to these two main groups. Several of the gaps lacked an unequivocal distinction to other gaps and in a number of cases gaps where gaps were overlapping each other.

The amount of different gaps identified and the problem of clearly distinguishing them from each other makes it unlikely that it will be possible to identify a larger number of specific gaps with a general explanatory value. Despite the lack of generalizability of identified gaps, the authors consider innovation-gap analysis to have an major innovation-management value.

Innovation management research have over the years moved its focus from isolated activities and individuals (e.g. R&D departments and entrepreneurs) to show that a more holistic and balanced approach is the most advantageous when developing an innovative organization. Based on that authors' opinion is that a gap analysis could be an effective way for total innovation oriented managers to maintain a holistic focus on balanced innovation.

To sum up the authors' opinion is that continuous gap-analysis could be used to set a holistic focus on innovation. Focus for such gap-analysis is suggested to be set on factors with a critical impact on innovation performance. When doing so attention is suggested to be set on the width of gaps considered to be of critical importance for innovation performance. Analysis of gap-width should be addressed both with respect to current gap-width and critical width were gap-width generates negative effects on innovation-performance to determine when a gap is worth reducing.

7 Practical implications:

The practical implication of this survey is that a lot of innovation-gaps can be identified and that they seems to have a potential negative impact on innovation performance by fragmenting the innovativeness of an organisation.

Different gaps identified in the survey were often overlapping and hard to distinguish from each other. Why results implicate that manager with a total innovation perspective rather should use gap-analysis as an integrated, on-going part of continuous innovation management than trying to identifying predefined gaps.

The authors' opinion is that a company specific and continuous gap-analysis could be an effective way for total innovation oriented managers to maintain a holistic focus on balanced innovation. Focus for such gap-analysis is suggested to be set on factors with a critical impact on innovation performance. Doing so, managers are suggested to pay attention to the width of gaps considered to be of critical importance for innovation performance. Analysis of gap-width should be addressed both with respect to current gap-width and critical width were gap-width leads to negative effects on innovation-performance and thereby be able to determine when these should be reduced.

References and Notes

Backström, T. and Olsson, B. K., (2010), "Kaikaku - a complement to emergence based development," paper presented at the first ICDC Conference Kobe, Japan.

Dobni, C. B., (2006), "The innovation blueprint". *Business Horizons*, 49, 329.

Hallgren, E., (2009), "How to Use an Innovation Audit as a Learning Tool: A Case Study of Enhancing High-Involvement Innovation". *Creativity and Innovation Management*, 18, 48.

Hayton, J. C., (2003), "Strategic human captital management in SMEs: An emperical study of entrepreneurial performance". Human Resource Management; Winter 2003; 42, 4; ABI/INFORM Global pg. 375

Hayton, J. S. C and Kelly, D. J., (2006), "A compentency-based framwork for promoting corparate entrepreneurship". *Human Resource Management*, Fall 2006, Vol. 45, No. 3, Pp. 407–427

Karlsson. H. and Johnsson M., (2010), "Interview Supported Innovation Audit: how does a complementary interview affect the understanding of an innovation audits results when the interview is based on the audit statements," paper presented at the third ISPIM Innovation Symposium, Quebec, Canada.

Kelly, T., (2001), *The Art of Innovation*, New York, Random House.

Kelly, T., (2005), *Ten faces of Innovation*, USA, Broadway Business.

Markides, C., (1998), "Strategic innovation in established companies," *Sloan Management Review*, 39(3), 31–42.

O'Reily, C. A. and Pfeffer J., (2000), *Hidden Value: How great companies achieve extraordinary results with ordinary people*, Boston, USA, Harvard business school press.

Pearson, A. E., (2002), "Though-Minded Ways to Get Innovative." *Harvard Business Review* 80(8): 117-124.

Ribeiro-Soriano, D. and Urbano, D., (2010), "Employee-organization relationship entrepreneurship: an overview", *Journal of Organizational Change Management*, Vol. 23 No. 4, 2010, pp. 349-359

Tidd, J. & Bessant, J. (2009), *Managing Innovation*, West Sussex, England, John Wiley & Sons Ltd.

Un, A. C and Montoro-Sanchez, A., (2010), "Innovative capability development for entrepreneurship. A theoretical framework", *Journal of Organizational Change Management*, Vol. 23 No. 4, 2010, pp. 413-434

Von Hippel, E., Tyre, M., (1995), "How "Learning by Doing" is Done: Problem Identification in Novel Process Equipment." *Research Policy* (January, 1995) p. 1-12.

Xu, Q. et al (2006), "Total Innovation Management: a novel paradigm of innovation management in the 21st century", *Springer Science+Business Media*, 3 November 2006, 32:9–25