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.*

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Abstract: SMEs tend to lack the ability of sustainable development through cost-effective and repeated innovation. One way to find out a current innovation state is to run a self-assessment innovation audit, which are well used but got critics to not show reliable results The authors formed research question: How might a complementary interview affect the understanding of the result of the innovation audit when the interview is based on the same statements used in the audit? The study was conducted at two Swedish SMEs with a mix of management and personnel. 21 respondents at both companies answered 840 audit-statements and equal amount of interview questions rephrased from a "how-perspective". 4 audit-statements were left blank and 103 interview questions were answered, "I don't know". A great differ in the respondents understanding appeared and the conclusion was that a self-assessment innovation audit might not show reliable results conducted without a complementing interview.

Keywords: innovation audit; interview support; SME; method; gap

Problem:

The authors are working on a longer project that aims to strengthen innovation capacity in a number of Swedish SMEs. A first step in this work was to create an image of the participating SMEs current state of innovation.

Research as well a experience from the industry indicates a low consciousness in SMEs innovation management. Even globally successful companies at the technological edge seem to have a tendency to focus only on technology-based innovations and to a great extent manage innovation as part of the product development process (Christensen, 1997) (Tidd and Bessant, 2009) One common consequence of a deficient innovation management is that SMEs often tend to lack the ability of sustainable development through cost-effective and repeated innovation.

The authors have in various innovation related roles outside the academia under several years met a large number of SMEs and noticed that SMEs often tend to lack the ability to manage innovation in a effective way. They are often more capable of manage those parts of the innovation process that is concentrated around product development e g prototyping and less capable to handle early and late stages of the process e g searching for innovative possibilities or capturing other values than those directly related to increased sales, IP-rights or other values closely connected to the core of innovation. They seem to be unaware of factors that affects innovation capability and the innovation possibility outside the are of innovative products.

SMEs also seems to need to form a knowledge platform of the current state of innovation to know how and where to direct their innovation management. The knowlegde captured from an innovation current state (current state) leads to awareness of strengths, weaknesses and possible improvements of their own current state of innovation, which could be used to develop their strategic innovation platform.

One way to find out a current innovation state at a company is to run an innovation audit, which was suitable for the project the authors are working in. As the authors intend to make several audits of future participating companies in the project, the authors wanted to analyze the results from an audit with purpose to understand the results even more. How does a complementary interview affect the understanding of the result of the innovation audit when the interview is based on the same statements used in the audit?

Current understanding:

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. For an organization to be deliberate and repeatedly innovative a conscious innovation management is required. (Dobni, 2006) (Tidd and Bessant, 2009) Much research has been conducted about the management of the complex innovation process and a large amount of schematic models describing the innovation process is developed, which in an overview perspective are quite similar to each other (Andersson, 1996) (Ottosson, 1999) (Baxter, 2002) (Michanek and Breiler, 2004) (Tidd and Bessant, 2009). There are also a lot of literature describing how to manage innovation (Kelly, 2001) (King and Anderson, 2002) (Adair, 2004) (Johansson, 2005) (Utterback et al., 2006) containing checklists, stories of successful management and “to think about”.

Innovation models and innovation processes mention strategies about innovation in different ways. Innovation strategies or strategic innovation is two expressions not be mixed up or misused, but still important for innovation management. An innovation strategy is, to say, more of a way to develop innovations towards a identified market. Strategic innovation is on the other hand a way of thinking, planning and using innovation as a tool in firms who want to be competitive in the long run and use the existing business an a innovative way (Tidd and Bessant, 2009).

From research the authors found different kind of tools to measure innovation or to analyze organizations innovation management (Chiesa et al., 1996) (Noke and Radnor, 2004) (Adams et al., 2006) (Tidd and Bessant, 2009), The purpose with those tools are to identify strength and weeknesses in, mapping, or improving innovation management (Noke and Radnor, 2004) (Adams et al., 2006) (Tidd and Bessant, 2009), or for technical innovation (Chiesa et al., 1996) and to measure effectiveness of performed innovations. Several audits have been developed to provide a better opportunity to show an organization's present situation of innovation. Audits helps to highlight strengths and weaknesses in order to do internal analysis as well as external comparisons. Audits are in general based on a number of statements over which the respondent is supposed to self-estimate the match of the statement and the way the organization handles innovation or an innovation process. Chiesa (Chiesa et al., 1996) developed an technical innovation audit in combination with interviews to identify strength and weaknesses with focus beyond the ordinary developing process but in technical innovations.

When studying described measurement tools above and well-known innovation models, one can realize that an important criteria for innovation performance is to involve the organization into the innovation process. Dobni (Dobni, 2006) showed the importance of organization involvement for successful innovation. However, the authors notice that there seems to be a lack of broad organization involvement through those studies. Furtheron there seems to be a lack of reliable measurement tools with clear references connected to every participating persons mind or knowledge. As innovation is an complex area who every person might have their own opinion about, the authors find it interesting to analyze the result from an audit to find how participating people share references according to innovation at their company. The authors don't find it necessary to develop another audit, there are already a lot of them covering the most important parts of the innovation model and important innovation criterias.

Recently, criticism is directed to audits as a measure tool (Hallgren, 2009). Research show that the results from audits are more suitable to support internal discussions than external benchmarking. Audits does not seem to be so reliable used as tools for benchmarking between different companies (Tidd and Bessant, 2009) and the organizational learning from the audit are often said to be more of an effect of learning from the external audit provider Further has research showed that an organization have to be rather advanced to be able to accomplish and benefit from a self-assessment audit on their own (Hallgren, 2009). Furthermore some audits only involve the management group but suggest that broader involvement should be considered, research indicates that audits need to be supplemented with something more to see the effect of them (Hallgren, 2009) which also was done by complementing interviews according to Chiesa (Chiesa et al., 1996) though they found respondents to consider asked questions as difficult and complicated to understand.

Research question:

As the project is a long-term project and the authors intend to make several audits of future participating companies, the authors wanted to gain a deeper understanding from the chosen audit. In order to do so the authors made an additional interview based on the audit which formed the following research question: *How might a complementary interview affect the understanding of the result of the innovation audit when the interview is based on the same statements used in the audit?*

Design/method/approach:

The study was conducted at two Swedish SMEs, Company A and Company B.
The selection of companies was done by that they would be in different businesses, having their own production and located in Eskilstuna, Sweden. The companies would also be interested in developing an more innovative structure to the company. Another reason for studying companies located in Eskilstuna was to be nearby Mälardalen's University for which the author belongs to.

Company A is one of the leaders in their niche of components in the car manufacturing industry and their customers are spread all over the world. Company B is an electronics consultant which develops and produces electronic components to be built in other products. The authors met the CEOs at both companies to explain how the survey would be managed. Audits and interviews were conducted with both management and personnel from different departments within the companies. The CEOs choose all personnel to participate in the survey and the authors had no impact of the selection, nor didn't they know anyone in person before the survey. According to the method strategy, the authors were focusing at working areas and not on gender or age. The purpose with this method was to collect as broad information and knowledge as possible from the companies. At company A did 11 people out of a total staff of 65 participate and at Company B did 10 people out of a total staff of 38 participate, at both companies there were a mix of management and personnel according to innovation models which support the involvement of "the whole" company into the innovation process. By involving them in the survey the authors assumed to get a true picture of the current innovation state.

In order to identify a current state of innovation the authors chose to use a pre-developed audit. The audit is developed by Tidd and Bessant[i] (Tidd and Bessant, 2009) and the audit headline is "How do we manage Innovation". This audit was chosen because it is part of a comprehensive theoretical context developed by well-reputed scientists with long experience from academia as well as industry.

The audit is based on five areas critical for successful innovation management, including Strategy, Processes, Organization, Linkages and Learning. it is a self-assessment audit that contains 40 statements, eight from each area, that describes "the way we do things here", e.g. *We are good at learning from other organizations*. In order to gain a deeper understanding of the audit results the authors choose to complement the audit with an additional interview. Interview questions was based on the audit statements but rewritten as questions from a "how" perspective e.g. *How do you learn from other organizations?*

Both audits and interviews were given in Swedish why the original audit were translated into Swedish. All respondents conducted the audit before doing the interview. Audits and

interviews were sometimes conducted the same day but more often at different days, not more than one week between the audit and interview.

Audits and interviews were given at the companies. All respondents from company A took the audit at one occasion and all respondents from company B at another occasion. Instructions as well as definitions where written at each audit but also given verbally before handed out to respondents. Respondent answered the audit by scoring each statement with a number from 1 (not true at all) to 7 (very true) depending on how well they considered statements to describe "the way we do things around here". An average time for one audit was about 20 minutes. The respondents sat in the same room but no discussions were allowed, if there was any problem in understanding the statements the respondent could ask the authors who were present the hole time. When the respondents had any questions the author made the same statement but in other words.

The interview questions were structured with open answers and conducted individually by each one of the respondents. The interviewer (one of the authors) read the questions loud and the respondent was free to speak without being interrupted or corrected. When respondents did not understand a question the interviewer gave a further explanation or rephrased the question without changing the overall meaning. The average time for conducting the interview where approximately 1 hour and 10 minutes. The interviewer typed the answers simultaneously as the respondent gave the answer and audio-recordings were also made.

In total 21 out of 103 possible respondents at both companies, answered 840 audit statements and 840 interview questions that where documented through written audits, audio recordings and written interviews notes.

Findings:

Interview answers were given on a spontaneous five-graded scale. Regardless of the content of the answer and interview area all interview answers could be suited into one of five subgroups at this scale. The scale ranged, at one extreme, from not being able to answer the question, to - at the other extreme, being able to give an answer that described not only *how* a certain behavior was conducted but also *why* it is conducted and in that way. All five subgroups of the scale were:

Table 1: Spontaneous answering scale

not	*if*	*what*	*how*	*why*
Not able to answer	Able to answer if done	Able to answer what is done	Able to answer how is done	Able to answer why done

Table 2 below shows the average audit score of all 40 statements for each of the respondents from both companies. Scores where given on a scale ranging from 1 (not true at all) to 7 (very true) depending on how well the respondents considered statements to describe "the way we do things around here". The average audit score of company A is 3.9 leaving four respondents with under-average scores and four with over average scores - which gives a total score-span of 2.0 units. The average audit score of company B is 5.3

where four respondents had individual under-average scores and five over-average scores. The total score-span of company B where 1.8 units.

Table 2: Respondents average audit score

Respondent	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*Co total average*
Co A	3,3	3,4	3,6	3,6	3,6	3,9	3,9	4,2	4,3	4,3	5,3	3,9
Co B	4,2	4,4	5,2	5,2	5,3	5,4	5,6	5,7	5,9	6,0	-	5,3

Out of 840 audit-statements, e.g. *we work well in teams,* four statements were left unanswered. One respondent from company B choose to leave two statements blank, one from the linkages-area and one from the process-area, one respondent from company A left one organization-statement blank and a second respondent from company A choose to leave a blank answer at one of the organization-statements.

Out of 840 interview questions, e.g. *How do you work in teams?,* 103 where answered "I don't know". According to the interview answers, the reason for not being able to answer the interview questions where mainly two;

1. The respondents did not know "how", "what" or sometimes even "if" the organization worked with what was asked for e.g. working in teams. "I don't know"-answers where often motivated with "It is not my area".

2. The respondent did not fully understand the meaning of the area asked for. E g when asked "how do you work in teams" the respondent did not know what teams there were or did not understand what was meant by "teams".

Table 3 lists the number of unanswered audit statement and interview questions and shows how these are distributed over audit/interview areas.

Table 3: Number of audit statements and interview questions not answered

Areas	Co A Average audit score	Co A Blank audits	Co A "I don't know"-answers interview	Co B Average audit score	Co B Blank audits	Co B "I don't know"-answers interview
Strategy	3,9		24 (of 88)	5,5		8 (of 80)
Processes	3,9		10 (of 88)	5,1	1(of 80)	10 (of 80)
Organization	4,1	1(of 88)	5 (of 88)	5,4		5 (of 80)

Linkages	4,3	1(of 88)	14 (of 88)	5,5	1(of 80)	9 (of 80)
Learning	3,5		10 (of 88)	4,9		8 (of 80)
All areas	3,9	2 (of 440)	63 (of 440)	5,3	2 (of 400)	40 (of 400)

Table 4 below lists the interview questions from each of the five interview/audit areas that received most "I don't know answers". Seven out of ten statements connected to those questions (e.g. statement *we work well in teams* and the question *How do you work in teams?)* where scored higher in the audit than the average statement of the area. These are colored marked in the table below. The interview questions from each of the five interview/audit areas that received *least* "I don't know answers" is also listed in the table.

Table 4: Average audit score

Area	*Co*	*No. of question and statement*	*No. of "I don't know"-answers to the interview question*	*No. of audit estimations left blank*	*Question average*	*Area average*
Processes	A	Processes no 22	5	0	4,2	3,9
	A	Processes no 37	0	0	5,7	3,9
	B	Processes no 32	3	0	4,6	5,1
	B	Processes no 37	0	0	5,4	5,1
Linkages	A	Linkages no 34	5	0	3,0	4,3
	A	Linkages no 29	0	0	4,6	4,3
	B	Linkages no 29	3	0	4,6	4,3
	B	Linkages no 14	0	0	5,8	5,5
Learning	A	Learning no 40	4	0	3,5	3,5
	A	Learning no 15	0	0	3,8	3,5
	B	Learning no 20	3	0	5,2	4,9
	B	Learning no 15	0	0	5,6	4,9
Organization	A	Organization no 18	2	0	4,5	4,1
	A	Organization no 8	0	0	5,1	4,1

	B	Organization no 18	2	0	5,4	5,4
	B	Organization no 8	0	0	6,0	5,4
Strategy	A	Strategy no 21	7	0	4,4	3,9
	A	Strategy no 1	0	0	4,0	3,9
	B	Strategy no 36	2	0	4,0	5,5
	B	Strategy no 21	0	0	4,4	5,5

Contribution:

The major contribution of the complementary interviews was that it offered additional reference points, which made it possible to refer different answers to each other and to interview answers. Thereby offer a more nuanced understanding of the results. Especially three kinds of reference points affected the understanding of the audit results; the spontaneous answering scale as shown an table 1; non-answers of both audit statements and interview questions (audit statements left blank and interview questions answered "I don't know"); average audit score of statements interlinked with different interview questions or groups of interview questions.

How did the spontaneous answer scale (not, if, what, how and why) affect the understanding of the audit results? The spontaneous scale made it possible to refer individual answers to each other and thereby reveal differences in knowledge about the statement areas. This could indicate that results from the audit describe *if* respontents are working in a way that supports innovation rather than to what extent that behavior is implemented throughout the organization. E.g. one respondent who is able to score an audit statement without being able to describe *how* the statement is conducted (or even what), which could indicate that the respondent know what is done but is not part of that work.

How did the non-answers of the audit and interview affect the understanding of the audit results? The numbers of non-answers given at the interviews were more than 25 times the number of non-answers given at the audits.

The two main reasons for not being able to answer the interview questions seemed to be either lack of knowledge of the area asked for or not understanding the question asked. When respondents did not know "how", "what" or sometimes even "if" the organization worked with what was asked for e.g. working in teams. "I don't know"-answers were often motivated with "It is not my area". The difference between number of non-answers given at the audit and non-answers given at the interview because of lack of knowledge in question asked could also implicate that respondents know about what is asked for but is not part of that themselves.

The interviewers often felt that respondents were unable to answer the interview questions because they did not understand the question. Interview questions were based

on the audit statements which means that if respondents did not fully understand what was asked for in the interview one should expect them to have problems with the statements as well. If true, that would indicate that respondents at several occasions estimated how well a statement matched “the way we do things around here” at the company without fully understanding what was actually estimated.

How did audit scores of statements that are interlinked with different interview questions or groups of interview questions affect the understanding of the audit results? The most surprising finding was when referring average audit scores to interview questions with the most “I don’t know” answers. It showed that 7 out of 10 of the audit statements interlinked with the interview questions with most “I don’t know answers” (of each area) were given a higher audit score than the average score of that audit area (e.g. linkages-area). This could indicate that the respondents did not fully understand what they where estimating because the statement was given a high average score in the audit (e.g. considered to give a good description of “the way we do things around her”) but a large proportion of the respondents were unable to describe “how”.

Overall interviews offered additional references, that were not absolute, but still provided a possibility to refer individual answers or groups of answers to each other and helped to reveal nuances that could not be read out of the audit on its own.

Practical implications:

According to this survey, based on the research question, the authors have pointed out several findings that might have an affect in understanding the results of an additional interview to an innovation audit. Research show that the results from audits are more suitable to support internal discussions than external benchmarking (Hallgren, 2009) (Tidd and Bessant, 2009) which should be taken into account when practical implications are to be discussed. This kind of interview-supported-audit-method might be a tool that increases the usability of audits as benchmarking tools, which the authors would be interesting to follow through future research.

As a result of this survey, the authors find the complementing interviews useful for; Existing innovation audits in order to detect differences in how a respondent is able to answer from a given statement and an open question regarding the same area; A simple add-on to established innovation audits the method showed in this paper offers a extended frame of reference; As a frame of reference that could increase the usability of existing audits in respect of an organization's internal innovation analysis as well as its reliability in scientific and academic context; Extended comparability that increases the reliability of data analyses by e g lessen the subjectivity when data is collected by two or more interviewers and/or when using of a common frame of reference when interpreting individual answers.

The main implications and usefulness for academia is the possibilities to conduct more detailed analyzing in accordance to the collected data. The interviews allow increased analyzing in terms of internally comparability between e g individuals, groups of individuals, departments and positions. Further on, different measurement occasions, does not only show development of areas measured but also development in individuals awareness of innovation, which might reveal innovation-gaps and innovation-imbalances. Which also, even further on, can be used externally when comparing innovation

awareness between different companies.

Practical implications for practitioners could be that internal as well as external points of reference would extend the usability and positive effects of self conducted audits for organizations that choose to use such. Points of reference ease the complexity of the analyze-phase and make it easier to evaluate collected data. Something that could be especially important when someone from outside the profession of innovation is auditing their own business. Strength of the method is that it is easy to use and that it provides additional points of reference independently of what audit attached to. This makes it possible to use any established audit suitable for the company. A more accurate picture of current state of innovation increases practitioners ability to locate resources to strengthen their innovation capability in a better way by revealing potential innovation-gaps and innovation-imbalances. As an external point of reference it could be used as a fix point against which one or more results could be related to set light on how one or more results is related to the fix point. Could be used for in-house comparisons as well as for comparisons with results from other organizations.

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