Exploiting external information in continuous innovation processes
The impact of managerial IT skills and supportive capabilities on the innovativeness of multinational companies

Gunnar Oskarsson

Rannsóknir í félagsvísindum XI. Erindi flutt á ráðstefnu í október 2010
Ritstyrð grein
Reykjavík: Félagsvindastofnun Háskóla Íslands
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Performance in innovation processes is related to the exploration and exploitation of information, from both within and outside the boundaries of the firm (Dosi, 1988; Kim & Atuahene-Gima, 2010). Exploration contributes to the generation of new ideas and exploitation to the application of the new ideas combined with existing knowledge (Cohen & Levinthal, 1990). Hurley and Hult (1998) defined two constructs to explain the performance in innovation processes, innovativeness and the capacity to innovate.

Innovativeness

Innovativeness is related to the extent to which individuals in the firm contribute to innovations. Hurley and Hult (1998) define innovativeness as “the degree to which an individual, compared to others in the social system is relatively early in adopting something new” (p. 517). Innovativeness is an aspect of a firm’s culture and refers to the openness to new ideas, and the firm’s orientation towards innovation. The innovativeness is thus related to the firm’s culture and “acts in concert with various structural properties of the company to affect the innovative capacity of the organization” (Hurley & Hult, 1998, p. 44). According to Cohen and Levinthal (1990), innovative capacity is related to the firms’ absorptive capacity or how effective the firm is in absorbing new information and utilizing it for creating innovative products. When combined with resources and other organizational characteristics, such as knowledge sharing, learning orientation, trust and norms, innovativeness creates a greater capacity to innovate.

The resource based view (RBV)

The resource based view (RBV) suggests that firms possess resources and capabilities that are valuable, rare, and not easily imitable or substitutable, which enable them to achieve sustainable competitive advantage (J. B. Barney, 2001; Penrose, 1959; Wernerfelt, 1984). The RBV focuses on the firms’ resources that generate economic rents and as the fundamental drivers of competitive advantage and performance. In the RBV the firm is a seeker of unique or otherwise costly-to-copy inputs that create competitive advantage (Hsu & Pereira, 2008). The resource-based view has gained increased support as an approach for a research in strategy management, including the field of information systems and innovation theory. In their paper on the RBV and information systems research, Wade and Hulland (2004) state that “the RBV in IS
context has the potential to identify key drivers of superior business performance” (p. 128).

Information system resources

The IT capability literature rooted in the resource based view argues that various IT related resources, classified into three broad categories, technical, human and intangible, combine to form an IT capability that is valuable, rare, nonimitable and nonsubstitutable (Mata, Fuerst, & Barney, 1995; Gunnar Oskarsson, 2009; Sorensen & Stuart, 2000).

Mata et al. (1995) found that only managerial IT skills contribute to the sustainable competitive advantage of firms, as all other IT resources can be competed away and do therefore only contribute to a temporary competitive advantage. Managerial IT skills refer to the ability to provide leadership for the IS function, manage IT projects, evaluate technology options, manage change, and envision creative and feasible technical solutions to business problems (Feeny & Willcocks, 1998; Mata, et al., 1995).

Kling and Scacci (1982) introduced in a seminal article a model they refer to as ‘web of computing’ that provides a framework for understanding the impact of information technology on business processes. They argue that managers who use a web model are “more likely to see a technical change (or new policy) as embedded in a larger system of activity, as having consequences which depend on peoples’ actual behaviour, and as taking place in a social world in which the history of related changes may influence the new change” (Kling & Scacchi 1982, p. 4).

Supporting capabilities

Suggestions from a qualitative research and key informants enabled the identification of supporting capabilities that are of relevance for this research. The main focus was on the identification of capabilities that support the transfer of information in innovation processes and have an impact on the use of information technology systems in interaction processes. This resulted in 5 supporting capabilities, learning orientation, norms, trust, reward system, and NPD dynamic capability.

Learning orientation

A number of researchers have emphasized the impact of learning orientation on innovation capability and the ability to absorb and exploit knowledge from external sources (e.g., Chapman, O'Mara, Ronchi, & Corso, 2001; Dosi, 1988). Organizations committed to learning seek a full understanding of its environment, including customers, competitors and emerging technology and encourage their employees to use company time to pursue knowledge that may lie outside their immediate scope of work (Calantone, Cavusgil, & Zhao, 2002; Lin, Peng, & Kao, 2008). Lack of factors that facilitate and stimulate learning or the existence of barriers that hinder learning can prevent learning to occur and have a negative impact on the innovativeness of firms (Gieskes & Hyland, 2003), particularly in firms that operate under dynamic market conditions.

Norms

Employees’ habits, values and expected behaviours which are embedded in normshave an impact on how things are done within an organization. For example norms specify inter-unit communication, work standards and hours, language, decision-making processes and have an impact on individual/group performance.
Expectations. Prior research has suggested that norms for knowledge sharing are important in encouraging providers to share their knowledge (e.g., Davenport, Prusak, & Prusak, 1997; Jarvenpaa & Leidner, 1999). Strong norms, which have an impact on both face-to-face interaction and computer mediated communication, can help knowledge senders overcome the perceived costs incurred in taking time and expending effort to share information (Borgatti & Cross, 2003; Eng, 2006). On the other hand, due to norms of reciprocity, a person might feel that he is in debt by asking contacts for significant amounts of help resulting in a decrease in the extent of information seeking (Liao & Wu, 2010).

**Trust**

People are more willing to give useful knowledge when trust exists (Andrews & Delahaye, 2000; Tsai & Ghoshal, 1998) and are also more willing to listen to and absorb others' knowledge (Mayer, Davis, & Schoorman, 1995; Zand, 1972). Szulanski (1995) argued that the lack of perceived reliability or trust of the source of information might make it more difficult to initiate an effective transfer from that source and its advice. Mayer et al. (1995) defined trust as the “willingness to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (p. 712). The build up of an atmosphere of trust plays a big role in the early phases of the new product development process.

**Reward systems**

Prior work has suggested that motivation is important for information providers to engage in the effort and time required to register and transfer the information, even if the user has access to IT applications that facilitate the process (Davenport, et al., 1997; Hansen, Mors, & Lovas, 2005; Olivera, Goodman, & Tan, 2008). Researchers have therefore emphasized approaches to how firms can motivate users to transfer information and participate in the interaction process (Chang, Yeh, & Yeh, 2007; Lee & Ahn, 2007; Quigley, Tesluk, Locke, & Bartol, 2007). Similarly, there has been a growing interest in examining how motivational factors influence the extent to which recipients seek out, accept, and utilize external knowledge and participate in the interaction process (Levin & Cross, 2004; Szulanski, 2000).

**NPD dynamic capability**

New Product Development (NPD) is a strategic process wherein firms integrate disparate inputs from R&D scientists, engineers and marketers to jointly develop and launch new products (Dalton, 2009; Miller & Friesen, 1982). The NPD process involves idea generation, idea screening, concept development and testing, business analysis, prototype and market testing, technical implementation, and commercialization. The NPD process requires both efficient functional capabilities which refer to the day-to-day activities involving the execution of NPD operational processes and dynamic capabilities which are strategic processes whose objective is to shape functional competencies. Dynamic capabilities in NPD processes refer to the ability of the firm to reconfigure existing NPD functional capabilities aimed at meeting new requirements due to changes in market demands or technology when the opportunity or need arises (Boer et al., 2001; Kogut & Zander, 1996).
Research model

The discussion in the literature review covered a discussion on the factors identified and how they contribute to the understanding of the research topic. First of all, the literature revealed that the firm's innovativeness is a suitable dependent variable for the research, as it reflects the exploitation of external information in innovation processes and enables measuring the impact of specific processes and capabilities. With respect to information technology, the literature revealed that the only IT skills that contribute to the sustainable competitive advantage of firms are managerial IT skills. A number of supporting capabilities that provide favourable condition for the exploitation of information technology as well as in general for the transfer and use of external information were identified. Without these capabilities the potential impact of IT applications will not be realized. The conclusions of the literature review prompted the following research question:

Is there a positive relationship between managerial IT capabilities and the exploitation of external information in new product development processes and the sustainable competitive advantage through innovativeness of international firms and to what extent is innovativeness mediated by supporting capabilities?

The research questions takes the resource based view and focuses on the relationship between the leveraging of information technology (IT) for the exploitation of external information and the innovativeness of firms which has an impact on the sustainable competitive advantage of firms on one hand, and the impact of supporting capabilities on the other hand. The most important supporting capabilities are; learning orientation, norms, trust, reward system and NPD dynamic capability. Figure 1 depicts the research model.

![Figure 1. Research model](image-url)
Methodology

The research utilizes quantitative and qualitative approach concurrently, which does not only support the identification of capabilities, but also the use of different explanation types (Hovorka, Germonprez, & Larsen, 2008), which provides an opportunity to explain why or why not the capabilities contribute to the variance of the innovativeness of firms.

Survey

The quantitative research consisted of a survey that was sent out to managers of international firms originated in Iceland. There was a preliminary choice for the use of previously tested measurement items and scales, as it saves time and allows comparison with the work of others. The operationalization of the primary constructs in the model was based on the extant RBV and information systems literature. Table 1 shows the constructs used in the research, their origin and initial reliability.

Table 1. Constructs and their origins

<table>
<thead>
<tr>
<th>Scale</th>
<th>Initial research</th>
<th>Items</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial IT skills</td>
<td>(Bhatt &amp; Grover, 2005)</td>
<td>11</td>
<td>0.74-0.80</td>
</tr>
<tr>
<td>Learning orientation</td>
<td>(Bhatt &amp; Grover, 2005)</td>
<td>5</td>
<td>0.72</td>
</tr>
<tr>
<td>Norms</td>
<td>(Quigley, et al., 2007)</td>
<td>10</td>
<td>0.96</td>
</tr>
<tr>
<td>Trust</td>
<td>(Quigley, et al., 2007)</td>
<td>5</td>
<td>0.95</td>
</tr>
<tr>
<td>Reward system</td>
<td>(Chang, et al., 2007)</td>
<td>3</td>
<td>0.90</td>
</tr>
<tr>
<td>NPD Dynamic capability</td>
<td>(Pavlou &amp; El Sawy, 2006)</td>
<td>36</td>
<td>0.92</td>
</tr>
<tr>
<td>Innovativeness</td>
<td>(Calantone, et al., 2002)</td>
<td>6</td>
<td>0.89</td>
</tr>
</tbody>
</table>

All the scales used for the survey were used without changes, except that minor adjustments were made in the wording of only few questions. As it was not known in advance which capabilities contributed most significantly to the variance of the innovativeness of firms, a so called modelling approach appeared to be appropriate (Bryman & Bell, 2007). A statistical regression approach was found suitable, as it enables the identification of relationships in a study with a small sample size. Two main procedures were applied, backward deletion, which enables the identification of the variables that contribute most significantly to the independent variable, innovativeness of firms, and forward inclusion, which enables the identification of the impact of independent sub-scales of combined constructs, such as the NPD dynamic capability applied in this research. The combination of these two procedures contributes both to the development of a revised research model, and to further research on the topic.

Supplementary research

While this research is mainly an empirical study, it has qualitative antecedents. A combination of qualitative research and literature review enabled the identification of capabilities and factors that contribute the transfer and use of external information in innovation processes, and how they might contribute to the innovativeness of firms. Participants in five in-depth interviews and a focus group with informants who are knowledgeable about the topic suggested the items included in this research.
Following the qualitative research, the relevance of the constructs or variables for the research was verified in a literature review.

The qualitative research furthermore provided an opportunity to gain better insight into the topic for the research, which supports the interpretation of the results from the survey as well as to gain an understanding on the conditions under which the results apply (Tashakkori & Teddlie, 1998). The qualitative research contributes not only to theory, but also to practice, such as how the results may support managers in their decision making.

Data collection and analysis

The sample

In order to test the model, the survey was mailed to managers of Icelandic firms that have their own international operations, their own dedicated new product development (NPD) team or function, and an in-house IT department. The final sample included 228 potential respondents, including sales managers, production managers, service managers, managers of NPD teams and information technology managers. The survey was sent out in October 2009 and the final number of valid responses was 75, or 33%. The respondents were of 21 nationalities from 5 industries.

Table 2. Profile of respondents

<table>
<thead>
<tr>
<th>Breakdown by nationality</th>
<th>Breakdown by industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nordic countries</td>
<td>Large food technology</td>
</tr>
<tr>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>44,00%</td>
<td>53,30%</td>
</tr>
<tr>
<td>Other European American</td>
<td>On-line games</td>
</tr>
<tr>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>30,70%</td>
<td>22,60%</td>
</tr>
<tr>
<td>American</td>
<td>Large other technology</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>16,00%</td>
<td>10,70%</td>
</tr>
<tr>
<td>Asian</td>
<td>Large food production</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4,00%</td>
<td>9,30%</td>
</tr>
<tr>
<td>African</td>
<td>Small technology</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4,00%</td>
<td>4,00%</td>
</tr>
<tr>
<td>Australian</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1,30%</td>
<td></td>
</tr>
</tbody>
</table>

The results

The results from the regression analysis revealed that absorptive capacity, market orientation, and learning orientation contributed significantly to the innovativeness of firms, at 99%, 95% and 90% significance level respectively. This resulted in a revised research model that explains 54.5% in the variance of the innovativeness of firms.

![Diagram of research model](image-url)

*) Significant at 0.001, **) Significant at 0.05, ***) Significant at 0.10

Figure 2. Final research model
Discussion

Managerial IT skills
Contrary to the indications in the literature, managerial IT skills did not contribute to the innovativeness of firms in this research. Results from the in-depth interviews and focus group suggest that the reason might be that the technology has not yet reached the stage which makes it feasible to use information technology for the transfer of information in innovation processes (Kling & Scacchi, 1982). Another reason could be that the process of registering information and accessing information from the past is time consuming and will have a negative impact on the work dynamics which are needed in high technology industries. Instead of using information technology, information is generally transferred through what was referred to as the “old means” in the focus group, which is direct personal communication, either face-to-face or over the phone.

Absorptive capacity (part of the NPD dynamic capability)
A regression analysis including all the sub-scales of the NPD dynamic capability construct included in the final research model indicated that absorptive capacity made the most significant contribution to the innovativeness of firms of all the variables in the model. An organization's absorptive capacity reflects its ability to absorb, through its internal knowledge structures, information regarding appropriate innovations and apply effectively in the firms’ innovation processes. Therefore, even if the firm has access to information and it is shared, it will not contribute to the innovativeness if there are insufficient capabilities in the firm to exploit it (Cohen & Levinthal, 1990).

Market orientation (part of the NPD dynamic capability)
Market orientation contributes to the identification and anticipation of developing customer needs and the effectiveness of responding to them through the addition of innovative products or services (Slater & Narver, 1995). Market orientation is therefore important in sensing the market and helps the NPD work units to generate new products and respond to market needs faster than the competition (D'Aveni & Gunther, 1994; Eisenhardt & Martin, 2000).

Market orientation was the second most important independent variable making significant contribution to the innovativeness of firms. The results support the approach to knowledge management in the theory of continuous innovation, emphasising the need to involve all members of the organization who are in contact with customers to transfer market information regarding the product and possible improvements (Bartezzaghi, Corso, & Verganti, 1998).

Learning orientation
Learning orientation has an impact on how effective firms are in utilizing new knowledge in innovation processes and involves accumulation, sharing and application of knowledge (Bhatt & Grover, 2005). Learning is among the key topics in the theory of continuous innovation as it provides an opportunity to not only use knowledge and information directly in innovation processes, but also to accumulate knowledge and contribute to existing capabilities of the firm (Gieskes, 2001).

The regression analysis confirmed that learning orientation contributes to the innovativeness of firms, although it had the least significant impact (sig. 0.90) of the independent variables in the final research model. Learning orientation did not make a strong unique contribution (2.1%) to the explanation of the variance in innovativeness, indicating a lot of shared variance among the independent variables in the model. The most important contribution of learning orientation is its support to the contribution
of the other variables on the innovativeness of firms, which is an important message to managers.

Other capabilities

Contrary to indications in the literature, trust, and norms did not contribute to the innovativeness of firms. The same applies to three of the sub-scales for the NPD dynamic capability construct, coordination capability, collective mind, and reconfiguration. The construct for reward systems did not fulfil the requirements for reliability and was therefore excluded from the regression analysis.

Contributions

The research resulted in a number of contributions in terms of examining the relationship between capabilities and factors that have an impact on the innovativeness of international firms. The research takes the resource based view and is investigated within the framework of the theory of continuous innovation. The arguments for conducting the research with the framework of continuous innovation were the growing importance of learning in innovation processes emphasized in the literature (Bartezzaghi et al., 1998; Calantone et al., 2002; Gieskes, 2001). The main arguments for taking the resource based view was, firstly due to the need for leading companies to stay at the forefront of technology and new product development to sustain their competitive advantage in highly competitive environments (J. Barney, 1991; Peterson, 2002), and secondly as the RBV offers an opportunity to conduct a research that measures the impact of factors or capabilities on a specific process as opposed to the overall performance of firms (Ray, Barney, & Muhanna, 2004).

Contribution to theory

The main contribution of this research was the identification of capabilities and factors that contribute to the innovativeness of firms, with a particular emphasis on managerial IT skills and how they contribute to the effective use of information technology, aimed at facilitating interaction and the use of external information in new product development innovation processes.

The results indicated that managerial IT skills did not contribute the innovativeness of the firms included in the research. A thorough analysis based on contrast-class explanation (Hovorka et al., 2008) provided an insight into why managerial IT skills did not contribute to the innovativeness of firms according to this research as opposed to the contradicting indications derived from the literature. Most apparent was that the context, mainly the size of the companies, the stage of the development of suitable applications for information rich interaction, and the social system in which the respondents were working (Orlikowski & Iacono, 2001). Another possible explanation was that managerial IT skills might contribute more to later phases of the innovation processes, after a product development project is initiated.

Another important contribution was the identification of capabilities that emerged from the theory and a qualitative research that were expected to have an impact on the innovativeness of firms. The regression analysis revealed that a combination of three of the capabilities identified contribute significantly, and explain 54.5% of the variance of innovativeness of firms, absorptive capacity, market orientation, and learning orientation. All these capabilities fulfil the requirements of being unique and costly-to-copy inputs according to the resource based view (RBV) and therefore contribute to creating a sustainable competitive advantage of firms.

It was also of importance to identify that the remaining supporting capabilities, trust, and norms did not contribute to the variance of the innovativeness of firms, nor
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did three of the sub-scales in the NPD dynamic capability construct (Pavlou & El Sawy, 2006), coordination capability, collective mind and reconfigurability. Arguments, rooted in the theory, were however provided, and indicate that the context of the research, such as firm size and culture might have an impact on the results, and that the results may therefore not be generalizable for all firms, specifically larger organizations.

Contribution to practice

The main findings provide information that contributes to the development of new managerial skills that have an impact on the management of sharing and transfer of information and knowledge within the innovation process. Most importantly, the results indicate that managers should focus on the implementation of routines that have an impact on the identification, acquiring, analysing and assimilation of information and knowledge that lie outside the boundaries of the firm, and in transforming existing information into new knowledge, as well as in utilizing the acquired information into the development of new products.

Secondly, managers should aim for enhancing the market orientation of their firms, such as by stimulating employees and allocate sufficient time to scan the environment to identify new business opportunities, discuss changes in customer product preferences, and create a dynamic environment that enables the firm to respond quickly to changes in customer preferences and the business environment.

Last, but not least, managers should set a clear direction for learning in the firm, and implement a learning environment aimed at utilizing new information, not only for creating new products, but also for enhancing the firms’ innovation capability. They should also emphasise the importance of learning and transfer of information throughout the entire organization and even to alliances and others who can contribute to learning.

Limitations

Like all empirical research, this study is not without limitations. First, a larger sample size would have provided greater confidence regarding the generalizability of the findings. However, the diagnostics used throughout the analysis did not reveal any cause for concern regarding the overall data quality or the representativeness of the sample, and the main findings are consistent with theoretical expectations despite the modest sample size. Some of the findings were however inconsistent with theoretical expectations, but explanations provided indicated that the inconsistency were not necessarily due to the modest sample size.

As the research was exploratory in nature, and did not have longitudinal dimension, it was not possible to establish sustainability of the factors identified on the innovativeness of firms. It was therefore only possible to identify the associations, but the causality could not be established. The research used only self perception measures, which are in nature not longitudinal. Despite its weaknesses, self-reporting instruments are frequently used in management research and it has been identified that they even give more reliable measures than for example when using archival data (Dankbaar, 2007). The main observation is however, that the use of self reporting scales without further support, such as by using multiple measures (Garcia-Morales, Llorens-Montes, & Verdu-Jover, 2006) imposes limitations on the research.
References


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Appendix

Questions in survey

Managerial IT skills

To what extent does information technology department(s) in your firm:

- Understand business opportunities
- Are aware of firm's competitive priorities
- Understand business policies and objectives
- Solve business problems
- Initiate change in your firm

To what extent does information technology department(s) in your firm:

- Appreciate line management's contribution in setting IT strategy
- Trust line management in setting information technology goals for the firm
- Respect line management in setting information technology strategy for the firm
- Periodically consult line management in setting strategic role of information technology in the firm
- Share responsibilities with line management in the firm
- Share accountability with line management in the firm

Learning orientation

To what extent does top management in your firm commit resources for the following items:

- Enhancing organizational search for relevant knowledge
- Enhancing the acquisition of relevant knowledge
- Enhancing the assimilation of knowledge
- Enhancing the application of new knowledge into its existing core-competence
- Setting a clear direction for learning in the firm

Norms

To what extent do you personally?

- Believe that information offered by other manager(s) will be useful to you
- Believe that information being provided by other manager(s) will be accurate
- Trust the ability of other manager(s) to provide you with useful information
- Believe that other manager(s) is trying to help you
- Trust the other manager(s) to be honest with you when communicating information
When working on a task in new product development processes, to what extent does it seem that you and other individuals who contribute to the process develop a mutual understanding that each will?

- Share information on things when you think it might help the other person(s)
- Share information on strategies that seem to work well
- Let the other person(s) know about strategies or decisions that you doubt will work well
- Go out of his/her way to help the other person(s) with a problem or question
- Help the other person(s) without being asked
- Respond quickly to the other person(s) e-mails
- Send detailed messages in your e-mails to the other person(s)
- Keep in touch with the other person(s) during the task
- Send the other person(s) encouraging e-mail messages
- Share information on the market share achieved each year

**Reward systems**

Please indicate the degree to which you agree or disagree with the following statements:

- If team members in new product development process encounter failure, management encourages them to keep trying
- Management encourages team members to undertake entrepreneurial behaviour by supporting new ideas and risk-taking
- Initial failures in new product development process do not reflect on your competence

**NPD dynamic capability**

Please indicate the degree to which you agree or disagree with the following statements:

- We can successfully reconfigure our resources to come up with new product assets
- We can effectively integrate and combine existing resources into "novel" combinations

Please indicate the degree to which you agree or disagree with the following statements:

- We frequently scan the environment to identify new business opportunities
- We spend considerable time reading trade publications and magazines
- We are quick to discuss changes in our customers' product preferences
- We often review the likely effect of our changes in our business environment on customers
- We often review our product development efforts to ensure they are in line with what the customers want
- We are effective in implementing new product ideas
- We devote a lot of time implementing ideas for new products and improving our existing products
- We are quick to respond to significant changes in our competitors' pricing structures
Please indicate the degree to which you agree or disagree with the following statements:

- We are successful in learning new things within this group
- We are effective in developing new knowledge or insights that have the potential to influence new product development
- We are able to identify and acquire internal (e.g., within the group) and external (e.g., market) knowledge
- We have effective routines to identify, value, and import new information and knowledge

Please indicate the degree to which you agree or disagree with the following statements:

- We have adequate routines to analyze the information and knowledge obtained
- We have adequate routines to assimilate new information and knowledge
- We can successfully integrate our existing knowledge with the new information and knowledge acquired
- We are effective in transforming existing information into new knowledge
- We can successfully exploit internal and external information and knowledge into concrete applications
- We are effective in utilizing knowledge into new products

Please indicate the degree to which you agree or disagree with the following statements:

- We ensure that our work tasks (activities, designs, reports) fit together very well
- Overall, our group is well coordinated
- We ensure that the output of our work is synchronized with the work of others
- We ensure that the output of our work is of a form useful to others when needed (the right thing at the right time)
- We ensure an appropriate allocation of resources (e.g., information, time, reports) within our group
- The members or our work unit ensure a fair sharing of resources
- The members or our work unit are assigned to tasks that correspond to their task-relevant knowledge and skills
- We ensure that there is compatibility between the expertise and work processes of members or our work unit

Please indicate the degree to which you agree or disagree with the following statements:

- We effectively interrelate our activities to manage rapidly changing conditions
- We collectively manage our tasks to address situational demands
- We promptly make our contributions to the group with attention and care
- We are forthcoming in contributing our individual input to the group
- We have a global understanding of each other’s tasks and responsibilities
- We are fully aware who in the group has specialized skills and knowledge relevant to our work
- We carefully interrelate our actions to each other to meet changing conditions
- The members or our work unit manage to successfully interconnect their activities

**Innovativeness**

Please indicate the degree to which you agree or disagree with the following statements:

- Our company frequently tries out new ideas
- Our company seeks out new ways to do things
- Our company is creative in its methods of operation
- Our company is often the first to market with new products and services
- Innovation in our company is perceived as too risky and is resisted
- Our new product introduction has increased over the last 5 years