

DETERMINANTS OF SUSTAINABLE INNOVATION MANAGEMENT IN LARGE COMPANIES

[Klíčové faktory dlouhodobě udržitelného inovačního managementu
ve velkých společnostech]

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Abstract: The paper aims to form a useful tool for evaluation of sustainable innovation process in large manufacturing company. Several studies proved positive correlation between innovation and increased performance of companies and since large companies have the advantage of wide-range activities which opens new possibilities to innovate, they became driving force in innovation field. The main determinants of successful innovation are established based on literature research and used to create a questionnaire for the purpose of the examination of innovation management in selected company. Research suggests that main determinants need to be managed jointly because it is not possible to separate completely one determinant from another. The synergetic effect of all determinants complying together is proven to be a cause of successful innovation.

Keywords: determinants, innovation, large business, management, organization.

JEL classification: M10, O31, O32, O39

Received: 1.10.2018; Reviewed: 21.10.2018; 6.2.2019; Accepted: 19.6.2019

Introduction

Innovation is fascination trend which forces people to be better and to look for new, different ways of doing things. The same is required from companies. They need to offer something original, unique or improved in order to attract customers, investors or employees. Innovation has become necessary for survival and constant growth of company. Well managed innovation process has a significant impact to success on innovation, but there is not universal concept of successful innovation. Every process of innovation must be adapted for the specific needs of each company. On the other hand, establishing critical determinants of that process should produce guidance for prosperity of innovation.

Innovation process is influenced by many determinants that differentiate in their strength, importance or position in the innovation process. Interdisciplinary approach is needed to outline all determinants and not even that is a guarantee of capturing of all of them. It is possible to distinguish few main factors which are universal for every company but for application of the innovation process, the specifics of each company must be taken to consideration (Klewitz and Hansen 2014). Innovation is strongly influenced by external determinants such a current political situation, legal requirements on company`s activities, environment existing outside the company or cultural background of the state where the company is doing its business (Romijn and Albaladejo 2002). Managers of company should be aware of particularity of innovation process and consider all determinants in their decisions. Innovation usually does not serve only as instrument for higher profitability of company but also for society as whole, since it should bring something new and useful for the future.

The paper is divided into five parts starting with literature review where main trends are discussed, followed by methodology used in research and determinants of sustainable innovation. Results of research are included in next chapter continued by conclusion where summary of research is presented.

1 Literature review

One of the first remarks of innovation can be found in antic Greek philosophy made by Xenophon (474 BC): *“And were it made clear that the discovery of some way of raising revenue without hurting anyone will also be rewarded, this field of research too would not be unoccupied. In a word, once it becomes clear in every department that any good suggestion will not go unrewarded, many will be encouraged by that knowledge to apply themselves to some promising form of investigation. And when there is a wide-spread interest in useful subjects, an increase of discovery and achievement is bound to come”*.

Various definitions of innovation can be found in the literature. Naturally innovation is associated with new or dramatically improved product, process or service. Current approach to innovation started with Schumpeter (1934) who defined innovation as *“a historic and irreversible change in the method of production of thing”* and *“creative destruction”* (Schumpeter 1934, pp. 65). As newer definition Mueller and Thoring concept can be mentioned: *“Innovation is a concept that depicts not only something that is new but also that is economically viable, technically feasible and expected to be successful in the market”* (Mueller and Thoring 2012, pp. 153).

OECD recognized innovation as: *“An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations”* (OECD 2005, pp. 46). In the essence, every activity which a company undertakes can form something new which can be considered as innovation.

Peculiar ways of innovation can be found when comparing companies amongst themselves. Differences may result from national culture, regional culture, industry or type of company. In the comparison of large and small companies, size of the company influences the innovation. Small firms have the advantage of flexibility, efficiency, proximity to the market and motivation, large firms have the advantage of economies of scale and scope, financial and technological resources (Love and Roper 2015). Large firms usually have specialised innovation or research or development departments (Wong and Aspinwall 2004).

Boly et al. (2014) introduced fifteen fundamental innovation management best practises as: design, project management, integrated strategy, project portfolio management, suitable organization definition, innovation process improvement, competence management, moral support, knowledge management, competitive technology and intelligence activities, network management, collective learning, ideas research/creativity, RD activities, customer relationship management. Zien and Buckler (1997) introduced seven universal principles of innovative companies, stating the importance of relation between stakeholders. The main principles for building the innovative company are: shared vision, leadership, will to innovate, appropriate organization structure, key individuals, high involvement in innovation, effective team working, creative climate-positive approach and motivation systems (Tidd and Bessant 2009). Tang (1998) proposed a model of six determinants of innovation: information and communication, behaviour and integration, knowledge and skills, project raising and doing, guidance and support, and external environment. Importance of teamwork as essential feature

of innovative project is recognized by Hoegl and Gemuenden (2001), also team composition as base of experience and competencies (Cooper 2000) and the capacity to exploit knowledge transfer between team members with different skills (Tiwana and McLean 2005). Teamwork can be helped by an open environment (Andriopoulos 2001), psychological safety (Kessel et al. 2012), shared vision and goals (Al-Beraidi and Rickards 2003), clear objectives for group work (Egan 2005) and a supportive learning culture (Thompson 2003). Diversity in teams has been found to be more creative, whereas homogeneous groups, whose members possess overlapping skills, are less likely to develop creative ideas. (Blomberg et al. 2017). The concept of knowledge management has been recognised by numerous authors as an important determinant of innovation (Yamin et al. 1999; Darroch and McNaughton 2002; Carneiro 2002).

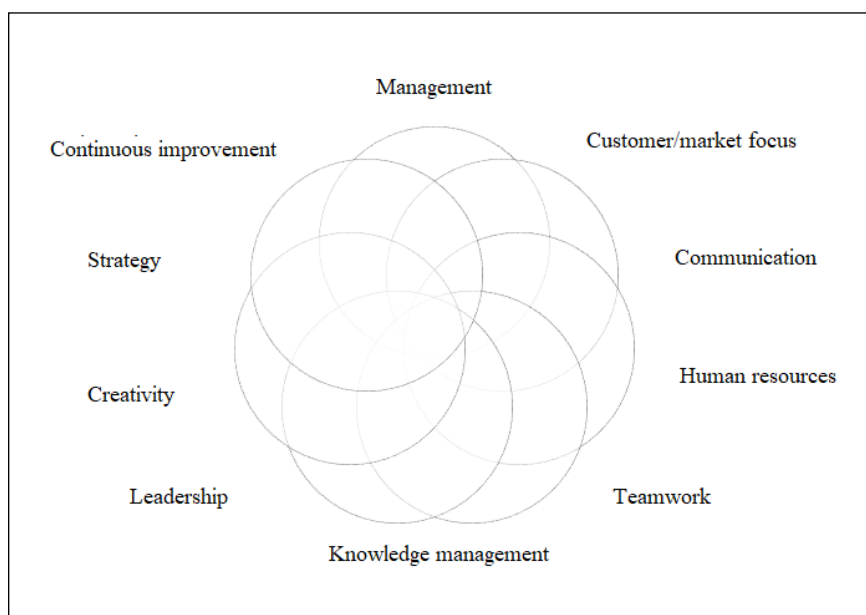
2 Methodology

The research is made by using secondary research where the research articles were primarily management oriented because focus was made on innovation within organisations. Based on the secondary research the questionnaire was made. It contains “yes” and “no” answer to for simplicity and for user friendly use. The questions are deliberately formulated to represent good practices resulted from secondary research and knowledge of researcher. The desirable good practise is hidden under "yes" reply with few exemptions. The case study was designed to test the basics of the questionnaire which can be also later use for evaluation of company in innovation management and to identify its strength and weaknesses. The questionnaire can be used as accessible and effective tool for management with clear guidance to improvement.

3 Determinants of sustainable innovation process

Determinants were established by their occurrence and importance based on multiple researches summarized by Read (2000). It contains ten main determinants of successful innovation: management, customer/market focus, communication, human resources, teamwork, knowledge management, leadership, creativity, strategy, continuous improvement.

Figure 1: Synergetic effect of determinants of sustainable innovation



Source: own processing based on Read 2000

It is essential that all determinants are overlapping between each other. The clear and precise separation of determinants it is possible but not recommendable. The synergy effect of determinants all together is the main reason for successful innovation.

The case study research was made in large Czech company which is part of international group where the level of operation management answered the questionnaire. The company operates as manufacturer and distributor of medical and hygienic products. The purpose of this case study research was to test the relevance of the question in selected company. The company was purposely chosen as successful innovation leader where successful innovation process is already in place. That way the questionnaire can be later used for less successful companies also as learning tool.

3.1 Management

Determinant called “management” is used in narrower sense and includes questions about vision, company`s structure, financial objectives or general approach to innovation activities.

Table 1: Management

Question	Yes	No
Do you have clearly stated vision?	X	
Are your short-time plans based on the vision?	X	
Is every employee aware of firm`s vision?		X
Does every employee participate on forming firm`s vision?		X
Is there specialised department focusing solely on innovation?	X	
Is the firm open to proposal from the line management?	X	
Are rules and procedures guiding the company activities written?	X	
If yes, are they strict?	X	
Does the firm`s structure help to take decisions rapidly?	X	
Is the firm structure flexible to innovation activities?	X	
Do you clearly state time and financial objectives before starting the project?	X	
Are time and financial objectives evaluated at the end of the project?	X	
Are any innovation activities cancelled due the lack of financial resources?	X	
If yes, what is the percentage of cancelled innovation?	30	
Are any innovation activities cancelled due the lack of technical skills?		X
Are any innovation activities cancelled due the lack of human resources?		X
Is there top management commitment and support for innovation?	X	
Is there different procedure for large and small innovation project?	X	
Are employees encourage to make improvements in their work area?	X	
Are there formal policies and procedures for improvements in employee work area?	X	

Source: own processing

3.2 Customer/market focus

Determinant called “customer/market focus” is used to examine the extent of interaction with customer and awareness of market trends. Source of new ideas is also introduced as part of the questionnaire.

Table 2: Customer /market focus

Question	Yes	No
Do new ideas come from external sources (customers/markets)?	X	
Do new ideas come from internal sources (employees, shareholders)?	X	
Does the firm understand customer's needs?	X	
Do you constantly search for feedback from customers?	X	
Are you surprised by development in your sector/market?		X
Do you analyse current trends in markets?	X	
Do you systematically compare your products with products of your competition?	X	
Do you work closely with local and national education system in order to communicate your needs in human resources?	X	
Do employees know what customers need and why is necessary to innovate?	X	

Source: own processing

3.3 Communication

Determinant called "communication" aims to examine external and internal communication of innovation. The extent of feedback is also introduced as part of questionnaire.

Table 3: Communication

Question	Yes	No
Do you collaborate with external partners during innovation activities?	X	
Is the feedback from customers communicated to everyone?		X
Are there any measurements of project progress?	X	
Are there any standards for frequency of meeting regarding innovation projects?	X	
Is innovation project communicated formally?	X	
Is innovation project communicated informally?	X	
Do use newsletters, bulletins, displays, boards to communicate the innovation activities?	X	
If yes: Can every employee contribute to them?	X	
Do you regularly review effectivity of your communication channels?		X

Source: own processing

3.4 Human resources

Determinant called "human resources" weigh up the hiring process in the company and to examine employee relations activities. Aspect of creativity of employee is introduced as part of questionnaire.

Table 4: Human resources

Question	Yes	No
Is the level of creativity questioned when hiring a new employee?		X
Are motivation factors of each employee examined?	X	
Is employee motivation monitored?	X	
Is resistance to change of each employee examined?		X
Are employees encourage to constantly strengthen their skills?	X	
Is the firm continuously searching for new creative employees?	X	
Does every employee have their own career plan?	X	
Is the reward system for introducing new idea well known?		X

Source: own processing

3.5 Teamwork

Determinant called "teamwork" looks into ties between employees while working together in teams. Level of objective standards is introduced as part of questionnaire.

Table 5: Teamwork – part I

Question	Yes	No
Are the teams for new projects put together solely on the purpose of new project?	X	
Do people take part in the innovative project on full time basic?		X
Do you build teams across departmental boundaries?	X	
If yes: is it always positive experience?	X	
Do you use teambuilding to build stronger ties?		X
Do every team member have clearly stated objectives in the projects and is he bound by them?		X
Do you regularly rotate team members in between teams?		X
Do you have reward system for participation in team projects?		X

Source: own processing

Table 6: Teamwork – part II

Question	Yes	No
Is the team located in close distance to each other (geographically)?	X	
Are the conflicts in the team resolved mainly within the group (opposite to take it to the higher levels management)?	X	
Is the team balance regularly checked through working on the project?		X

Source: own processing

3.6 Knowledge management

Determinant called “knowledge management” investigates the passing of the knowledge and the extent of codified knowledge. external and internal communication of innovation. The extent of feedback is also introduced as part of questionnaire.

Table 7: Knowledge management

Question	Yes	No
Is knowledge codified?	X	
Is knowledge captured and transferred though networks?	X	
Is tacit knowledge transferred differently than through personal experience?		X
Do you find knowledge as most important to its business?	X	
Do you constantly try to acquire knowledge from external sources?		X
Do you have frameworks to guide the innovation process?	X	
Do you offer creativity training for your employees?		X
Do employees, who had undergone some training, train other employees?	X	

Source: own processing

3.7 Leadership

Determinant called “leadership” studies the position of leader in the innovation process, his extent of competence. The perception of leader in the company is introduced as part of questionnaire. The questionnaire does not reflect the specific types of leadership or specific roles of people such as idea champions or gatekeepers.

Table 8: Leadership

Question	Yes	No
Does the leader have full responsibility of result of the innovation project?	X	
Is the leader rewarded based on the result of innovation project?		X
Are leaders recruited from inside sources?	X	
Are leaders encourage to give feedback to their underling?	X	
Are your leaders more like “coaches” then traditional bosses?		X
Do you support leaders to generate ideas?	X	
Do you support leaders to provide feedback?	X	
Do you support leaders to evaluate?	X	
Do you give leaders freedom for decisions?	X	
Do you distinguish between leaders and managers?		X

Source: own processing

3.8 Creativity

Determinant called “creativity” analyses the approach of company to creativity and its support. The reward for valuable ideas is introduced as part of questionnaire

Table 9: Creativity

Question	Yes	No
Does the firm systematically search for new ideas?	X	
Are employees encouraged to express new ideas?	X	
Is failure of new idea accepted?	X	
Is training to improve creativity offered to employees?		X
Is there any reward for employee whose idea turn out to be valuable?		X
Is the reward monetary?	X	
Is the reward non-monetary?	X	

Source: own processing

3.9 Strategy

Determinant called “strategy” probes the approach to strategy as basics for innovation. The position of strategy for innovation process is introduced as part of questionnaire.

Table 10: Strategy

Question	Yes	No
Is the innovation part of strategy?	X	
Is the innovation strategy clearly communicated?	X	
Do you focus on every type of innovation (product, process, marketing or organization)?	X	
Do you have clear parameters for choosing innovation activities you will pursue?	X	
Do you communicate the connection with firms values for every innovation project?	X	
When you are creating strategy do you use information about your competitors and the leaders in the market?	X	
Is your strategy based on your competencies?	X	
Is your strategy made solely by top management?		X
Do you consider yourself as innovation leader?	X	
Is the strategy plan formed for period of 3 years at least?	X	

Source: own processing

3.10 Continuous improvement

Determinant called “continuous improvement” tests the approach to continuous improvement in the company. The ability to learn from previous project is introduced as part of questionnaire.

Table 11: Continuous improvement

Question	Yes	No
Do you learn from every project?	X	
Do you carry out post-project reviews?	X	
Do you learn from previous unsuccessful innovation activities?	X	
Do you use measurements of innovation success?	X	
Do you compare the results of departments between themselves?	X	
Are innovation successes and failures reviewed regularly for lesson so it can improve strategy and process in the future?		X

Source: own processing

4 Research results

The aim of the research was to test the questionnaire and its functionality in a company that effectively use innovative processes and which is under constant pressure to improve. Based on result the company is aware of importance of management issues and have stated clear policy in this area. The company is centralized which helps to come up with solution easily and in the shorter period. Vision is created with participation of level of operations management for whom is vision well known. One recommendation would be to communicate the vision to every employee such as operators or manual workers. Constant participation of stakeholders on innovation is part of strategy of the company. The company is attentive of close cooperation with customers since the company is customer oriented. The company collaborates with hospitals and final users of their product so that their needs can be fulfilled. The company has well organized external communication, its web page is easily accessible with clear structure. The journal is published four times a year where new products and ideas are introduced. Internal communication is standardized and clear. Meetings for innovation projects differentiate based on size of the projects. With small project lot of meetings is made informally, for large project rules and standards are introduced especially for frequency of meetings. The feedback is usually not given to all members of the team. In the case of hiring new employee, the focus is on technical skills and education, creativity is questioned only for special positions. Current reward system is under reconstruction and new system will be introduced next year. It will contain monetary and non-monetary rewards for employees. Teamwork is well supported in the company, teams are built across departments, usually formed newly for every project. The expectation of each team member is not objectified, it is left to leader of the team to give guidance. Currently teambuilding is not supported from management. Codification of knowledge exist in the company and it is easily accessible through internal network. The company attempts to establish other ways for transferring tacit knowledge than thought personal experience. Leadership is recognized as important part of managing the company, leaders have a big freedom in decision making, the main important factors which needs to be respected is usually only financial budget. In the innovation projects leaders are usually traditional bosses, in production process they behave more as coaches. Constant search for new ideas is in coherence with company strategy and new ideas within company are welcomed. There is no support for training of creativity of employees. Strategy is fundamental for proper function of company where the company strategy must be in alignment with strategy of whole business group. Innovation is the necessary part of strategy and new ideas are appreciated in every aspect of company's activities. The company is aware of importance of review of finished innovation project. Objective measurements of successful

innovation are known before starting the project. Benchmarking of departments success is used as motivation for future work.

Conclusion

The paper focused on determinants of sustainable innovation management where selected determinants were evaluated by questionnaire. Research suggests that determinants need be managed in close connection with each other mainly because complete separation of one determinant from other is improbable. Innovation is successful when all determinants working well together with result in synergetic effect. It must be point out that focus solely at determinants occurring within the company cannot be recommended. Research is limited by the subjectivity of the corresponding managers and by the subjectivity of the researcher, given that the questionnaire was created based on secondary research and knowledge of the researcher. At the same time, it is necessary to emphasize that the research was made by case study in one company with the leading position in the market of selected sector, so it cannot be said whether the questionnaire can be used in a general scale without any modifications. Further research can be conducted to compare companies with different levels of company management.

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