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DYNAMIC BUSINESS MODEL BASED ON RESEARCH IN POWER ELECTRONICS INDUSTRY

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Abstract
The recent global economic crisis has caused an uncertain and challenging business environment and has battered managements that are running businesses all over the world. This paper focuses on new capabilities that can be used successfully in a fast changing business environment for improving firms' efficiency.
This research utilizes constructive approach including interviews and case studies. The relevant findings of the study are the elements of the key success factors: entrepreneurial strategy, R&D to market performance, dynamic operational excellence and innovativeness with links to the key actions which have led to new business model called dynamic business model (DBC). This research focuses on power electronics business industry which at the same time is a limitation. This research helps directors and managers to think more widely and make better decisions for the success of the company. This research results bring additional value of the previous studies regarding a firm's key success factors and dynamic capabilities.

Keywords
dynamic capabilities, entrepreneurship strategy, operational excellence, innovation, agility.

Introduction

Firms need to be more agile and resilient in their business sector due to the tightening market competition. The need of this agility is to make the firm more fit for the prevailing competition of the market. However, the resilience should be in line with their resources, capabilities, and readiness of the firm. Firms should reconsider and reconfigure their capabilities. This reconsideration and reconfiguration should also be agile and resilient in order to cope up with the dynamic market.

Conversely, Garvin argues [1] that a learning organization gets more skilled at creating, acquiring, and transferring knowledge which in turn helps it to adapt to new knowledge, interaction behaviour and insights. This interaction and communication will allow for peer learning, teamwork building, collaboration, and creative thinking. This creativeness becomes innovative knowledge and technology that helps in problem solving; i.e., overall performance of the organization [2]. However, while businesses are in this innovation process, they face challenges like threats and also changes in the company's actions or actors in the business environment.

For that matter, it is necessary for business to have different strategic architecture for different purposes that do not inhibit the flexibility of the firms or strategy. This architecture should have core competence in the business operations, as well as strategic intent; objective of the firm designed to capture the winning position [3]. Bessant argues that training and development are associated with increasing market share and growth [4]. There is need and importance for firms to keep up with the training and organization learning with and within the strategies.

Such knowledge could be extended further to global operations or large-scale operations.

In addition, the management should be innovative, encourage subordinate to be creative and make new innovative proposals as well as empowering them to make decisions. This should be done in a flexible but agile manner. The decision making process in the organization should be decentralized in fast changing technology environments in order to speed up the implementation of the new ideas [5]. Furthermore, the process should be efficient; covers all firms' processes primarily marketing, Research and Development (R&D) performance, Key performance indicators (KPIs) and production processes. These capabilities are necessary to sustain superiority in performance of an enterprise in a turbulent global market with rapid innovation and scattered sources of manufacturing capability, innovation, and invention [6]. This calls for agile use of dynamic capabilities as suggested by Teece [7]. The managerial nature and objective should be of entrepreneurial and with managerial sustainable competitive advantage activities that are more than just mere authority in order to capture value from its actions [8].

The central research questions of the present paper are:

1. Is it possible to create an efficient business model for power electronics firms which have operations in a turbulence business environment?
2. What are the key elements of such a model?
3. How could the key elements be implemented?

Research methodology

This paper collects previous case studies processed by the corresponding author of this article based on the interviews and data collections in the case companies collected in 2011, 2012 and 2013 and published in 2013 (some of articles are still forthcoming). Based on the previous studies focusing on dynamic capabilities and new business framework; weak market test was done and results are shown in the results and conclusion chapter.

Furthermore, the paper focuses on the domain of global electronics enterprises which have turbulence and complex business environment. Research work target is to test a new business model which includes dynamic capabilities and agility in a main role. The main motive for the paper is to create a framework with key success factors and define classes and slots for the selected domain.

Most research on dynamic capabilities has focused on the question "what" defines dynamic capabilities; this study focuses also on the "how" side. As for the practical implications, the new model helps firms to create processes that are more effective and to serve their customer better way in the future.

In total, the six interviewees have almost 200 years of experience in global business. Their experience is from high-level organisational position such as; board of the directors, management directors, vice presidents and global business directors (Table 1). They have worked in a global business, and each of them has had global director experience, two of them are women and four are men. Respondents overall experience in global director positions consist of R&D director, marketing director, factory director, logistics director, business development director and human research director experiences. This study tests the model of the key factors of successful company under the dynamic capabilities and agile concept.

Table 1
Working experience of respondents.

	Chairman of the board	Managing director	Management team member	Global director	Work experience
01-respondent	X	X	X	x	=>40
02-respondent	X	X	X	X	=>35
03-respondent	X	X	X	X	=>30
04-respondent	X	X	X	X	=>35
05-respondent			X	X	=>20
06-respondent			X	X	=>25

Theoretical construction of the model

The model is built based on own articles, previous articles, interviews mentioned in Fig. 1.

The Fig. 2 illustrates the flexibility and responsiveness of the model that is used in the research. The theoretical construction supports the dynamic capabilities framework that is also comprised of three primary elements: organizational structure, organizational performance, and competitive intensity [15].

In the following sections the five key elements of the model are introduced and linked to the theoretical view.

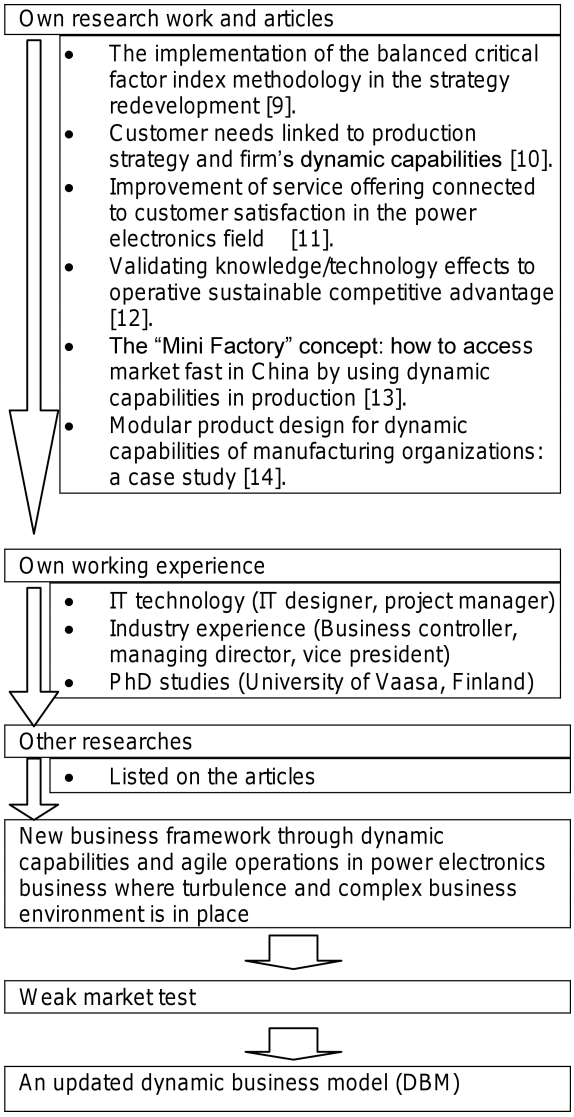

Fig. 1. Data collection process.

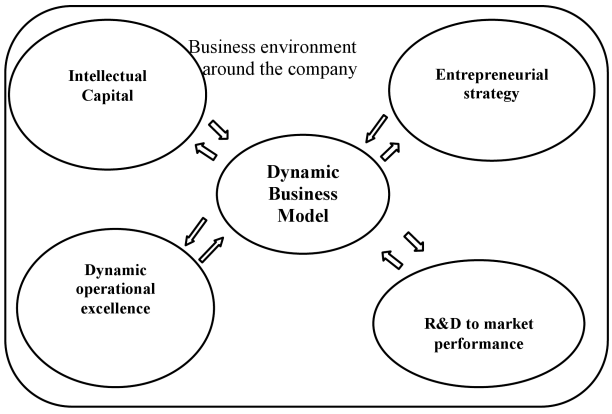

Fig. 2. Theoretical construction of the model.

(1) Entrepreneurial strategy

In entrepreneurial strategy, there should not be a gap between business management and technology, but rather be intertwined [16]. Business and technology strategies are dualistic viewpoints to a mutual strategy. The model in the study is designed in a way that it considers technology as a key player of the strategies. Strategy, in a business, organizes the firms' resources to position its self to win [6].

(2) Intellectual capital

For accelerated innovation as a whole, there is a need for open innovation. It focuses on ease of knowledge and technologies flow, interactive processes outwards through firm boundaries. This is due to the fact that, open innovation concept considers invention and innovation, but they should not necessarily happen at the same location of transformation. However, outside-in open innovation should also be encouraged since it creates an "innovative semi-permeable membrane" [17].

(3) Decentralized decision making organization model

Study made by Bourgault et al., (2008), on decision-making processes in New Product Development (NPD) linked to team autonomy, revealed that, formal decision making process is even more necessary for distributed teams that are highly dispersed. In addition, team autonomy is very important for the success of dispersed teams while formalization will add value to teamwork, most especially when team distribution is on the increase.

(4) Effective processes

How should industries new product manager take to improve new product performance? Ulrich and Tung's argued that it is also valuable to have modularity in an effective process [18]. Some of the benefits may include, flexibility, easier and faster task to perform at the end of an assembly [19–21] and even more effective material flow through the factory [14].

(5) R&D to market performance

Cross-functional teams are one option to handle the cross-functional responsibility as well as interfacing departments to promote better new product performance [22]. Porter's competitive forces have changed high-technology organizations to adopt cross-functional project group as in the deployment of new products and processes [23].

Results

Key success words in next five years period

Below (Fig. 3) is the graph of the answers to the question; what are key words that describe the requirements for success in next five years period?

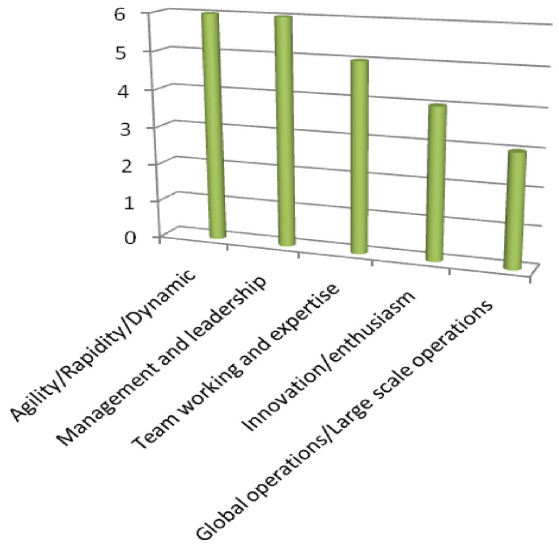

Fig. 3. Key success words.

The X-axis lists all the categories, which are mentioned most often. The Y-axis shows the number of answers in each category. On the graph, we can see that all of the interviewee said that, in the future most important issues are the reaction fastness to the changes around the company as well as management and leadership skills. This is especially for high tech companies where technology develops rapidly; it is the lifeline for companies to be fast and agile.

Researcher made weak market test for the proposed key success factors. The tested factors are:

1. Entrepreneurial strategy;
2. Innovativeness;
3. Decentralized decision making organisation model;
4. Effective processes;
5. R&D performance.

The free comment analysis

One respondent, who has long experience in marketing, managing director and chairman of the board, replied to the question of key success factors as follows:

The bold strategy is number one, innovation is needed, and the strategy framework provides the accountability and gives power for firm's management team. Decentralized decision-making organization is needed; profit centre leaders should have decision-making power. Some operations should be common for whole company group like; marketing and bran management, accounting systems, ways of thinking, values, rewards, travel and other general items . Employees who are not working to give value add for the customers, are people who normally secure their opinions, and therefore they are dangerous for the company. Product development must support customer commissioning. Selling persons should have a face, it is important for them to communicate with the customers and solve their problems. Product development people need more courage to go to see the customers; trade fair is good for them. Employees who do not have fresh ideas are not good for the company. Company vision is important to have but it is not enough. Company vision should make in teams and process to common company vision.

Weak Market test

Weak market test was done to test the key elements of the model. Next five parameters were tested based on the Table 2:

1. Entrepreneurial strategy;
2. Innovativeness;
3. Decentralized decision making organization model;
4. Effective processes;
5. R&D performance.

Everyone agree that for international company which have operations in many countries and firm's product is based on high technology, the given drivers are most important for the future success of the company. Table 2 shows the results of weak market test.

Table 2
Weak market test.

Key element	Key driver	n:o of respondents	agree	disagree
Entrepreneurial strategy	Company strategy is unique	6	6	0
Innovativeness	The firm encourages people	6	6	0
Decentralized decision making model	Profit units have decisions power	6	6	0
Effective processes	covers all firm's processes	6	6	0
R&D performance	covers all firm's processes	6	6	0

For entrepreneurial strategy five additional comments was given:

1. *Companies need to do things better, to do things in a different way from your competitors (see the blue ocean strategy).*

2. *If you copy the others, your company is an average level company and will not be able to be the best. Firm specific concepts are important from success point of view.*

3. *A successful firm needs entrepreneurship strategy. Start up company needs to have "business angel" who has a financial interest and is stabilizer the road with the Equalizer in strategic terms. When the business is going up and down, it implies that the company is not going through the easiest point when the problems grows - the risk is that the firm will lose its whole strategy.*

4. *A bold strategy drives forward. Mirroring the strategy means that firm' operations are not developed. Bold strategy means that the company is ahead of its competitors. In addition, the strategy must be credible, simple and feasible (not castles in the air, the objectives should be of a kind that it is possible to get to them).*

5. *It is important as well to do things different from your competitors.*

For innovativeness, six comments were given:

1. Innovation is important as well as the speed to win. Processes and innovation are two different things, and do not compete with each other, both are needed.

2. It is important to get straightforward and direct management to encourage people in their daily contacts. To provide ideas to develop functions and processes, as well as company's tools. Companies do not have big problems in general if you take out a strategy. Parts manufacturing fell from 31 days to five days removed from the 7000 issue, which were problem, any new machines do not invested, people liked to develop processes.

3. Agree, this is extremely important for "star ups" and for fast growing companies. Incentive programs increase the innovativeness. Employees should lead the way that they know where the company is going to and where the firm wants to go in the future.

4. This is working well - this is the key - not an easy thing - you should use all the possible tools that drive great results.

5. *Companies that are copying others ideas can only be of an average level. Own ways of doing things are important.*

6.*R&D organization is particularly important. Employees' involvement is important as well as the company's culture support of processes and operations (corporate culture = mother's milk).*

Decentralized decision making organization model

Everyone reported that a decentralized organization model is necessary. One respondent out of six said that decentralized organization model need also some centralized operations. The power should be decentralized. This is due to the fact that, people who are responding to operational business have budget responsibility. However, part of the operations is more efficient when centralized – this kind of activities is common for the whole company group and is like a platform design and human resources. Information flow between different organisation levels is crucial. The problem of matrix organization model was reported to be slow decision-making process and ambiguity that who is responsible for making decisions.

The following comments were reported from respondents:

1. *Decentralized decision-making organization model is the best. In addition, the value based Leadership and management is important. People need to be given the freedom and the power of high-speed decisions to look at the values of the company where one can get support for decisions. Hierarchical management is suitable for static business, more dynamic business environment need leadership which is based on visions and values.*

2. The profit centre needs to have the power to make decisions on the results of the issues that are needed. It is important to have underlying control strategies and other ways to keep the company in the right track. It is dangerous to lose the strategy of the companies. Compared to one restaurant, their special plate were at the beginning three kinds of meat, which were very good, then the restaurant started to save money and whole restaurant lost its competitive advantage.

3. Some of the firm's operations should be centralized, just like a platform design.

4. In a crisis situation, centralized model is better. In normal circumstances, a decentralized model is better. The matrix model is not good because people may be buried in the matrix and it may kill innovation; this is not my personal view but a typical response. Some of the customers are in matrix, mainly through auditing points because small offices can look good through the matrix organization. Matrix organization is needed when there is a sufficiently large organization; the matrix should be light and allows the cooperation.

5. It is valuable to have decentralized organization model, for example, our Indian organization should decide what to produce in India for the local market. Light centralized model is needed to get a clear global decision making model. The aim is to be fast.

6. Authorization is important. Management model should be clear and communicated to everyone. This enables the efficiency and good communication. Decentralized organization model is good, but there should be some operations that are centralized. Centralized should be platform design and HR for example. Operating procedures should be a common platform (mode of operation).

Effective processes

Process development is one of the key drivers to global companies. Effective processes also motivate firm's employees to work harder and they are proud of the company that they working for.

The following comments were given related to effective processes:

1. Efficient logistics and sales processes are extremely important. The importance depends on the business in which one is. Standardization is to a certain extent a good thing. Routines should be incorporated in the process. Firms should give enough time for innovation. Process management is a must! A successful business cannot be imagined without the processes.

2. Process development should be done in order to keep people motivated and to involve people in the firm's issues.

3. Important sub elements are: product data management (hardware & software), modularisation, standardization and mass customization.

4. Organization must have rules of the "game," work events must be standardized, and purchases must have standardized ways of working. The process should work in a same way in every sector (Standardized production, purchasing, office, etc). It is also a management issue because this makes it possible to develop and lead. In addition, it also allows space for innovation because people do not have to fight daily routines and "fires"

5. Processes should be effective.

6. It depends on the company's size. If you are a big company such as our company, it is extremely important that the processes are defined, they are implemented and develop.

R&D to market performance

When company have high technology product and are working in product business, R&D performance is one of the key driver for success. Biggest business success is coming through technology push, product leadership is important because it makes possible to get profitable growth. Respondents gave following comments:

1. In the product business, this is essential. Leading in a large group is the key; otherwise people are doing mistakes, and they do not know what the best is for the company; "the initial R & D phase (the prestudy phase) is most important". For great success, it is important to have the capability of anticipating the future needs of the customer that the customer cannot self-identify.

2. Definitely, this is the key driver.

3. Company should have clear instructions and operational models.

4. The more good products the company has - the better situation for the company. Good products drive better situation in a market place, assuming, of course, the products are what market needs. "Market pull" as well as time-to-market is essential. Right product range is essential.

5. The product leadership is essential because it achieves profitable growth.

Ideal company in employee's point of view

Employee's motivation to reach the firm's target is one of the key drivers to reach high results. For that matter, respondents had to answer the question on; specify idea company employee's point of view.

Figure 4 show that most significant issues for interviewee were demanding business target. Previously, it included; challenge goals, demanding working tasks, process improvement to reach the target. Second most important issues were flexible and well working organization model with fair leadership. Respondents reported that freedom and power to make decisions are important as well as an organization culture, which does not have tight organizational boundaries. Third important issue pointed out includes four categories, which were at the same level:

1. Team work and high motivation.
2. Innovations where everyone are involved.
3. Meaningful work and good working atmosphere.
4. High technology products.

Innovation and positive way of thinking as well as a good product technology were highlighted.

Last categories are company culture and international business concept, which both got two answers with comments; company cultures where people are important and company respect employees are important.

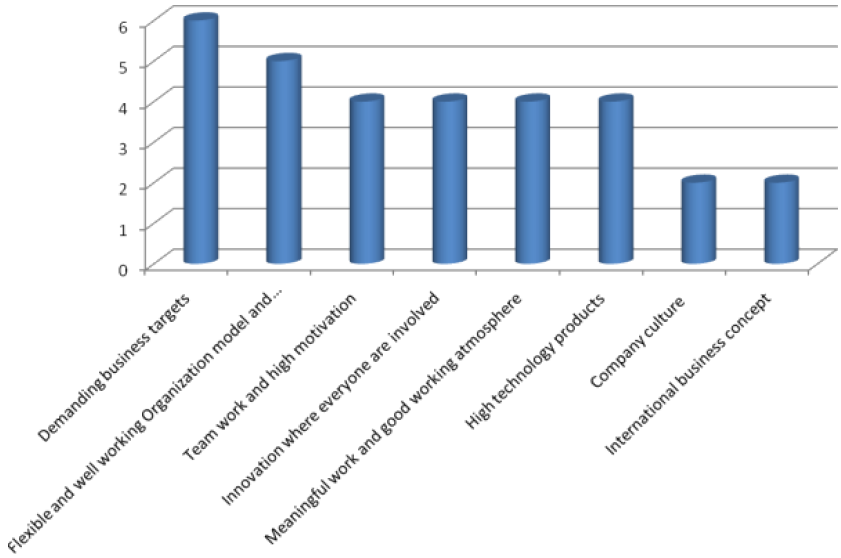

Fig. 4. Ideal company profiles.

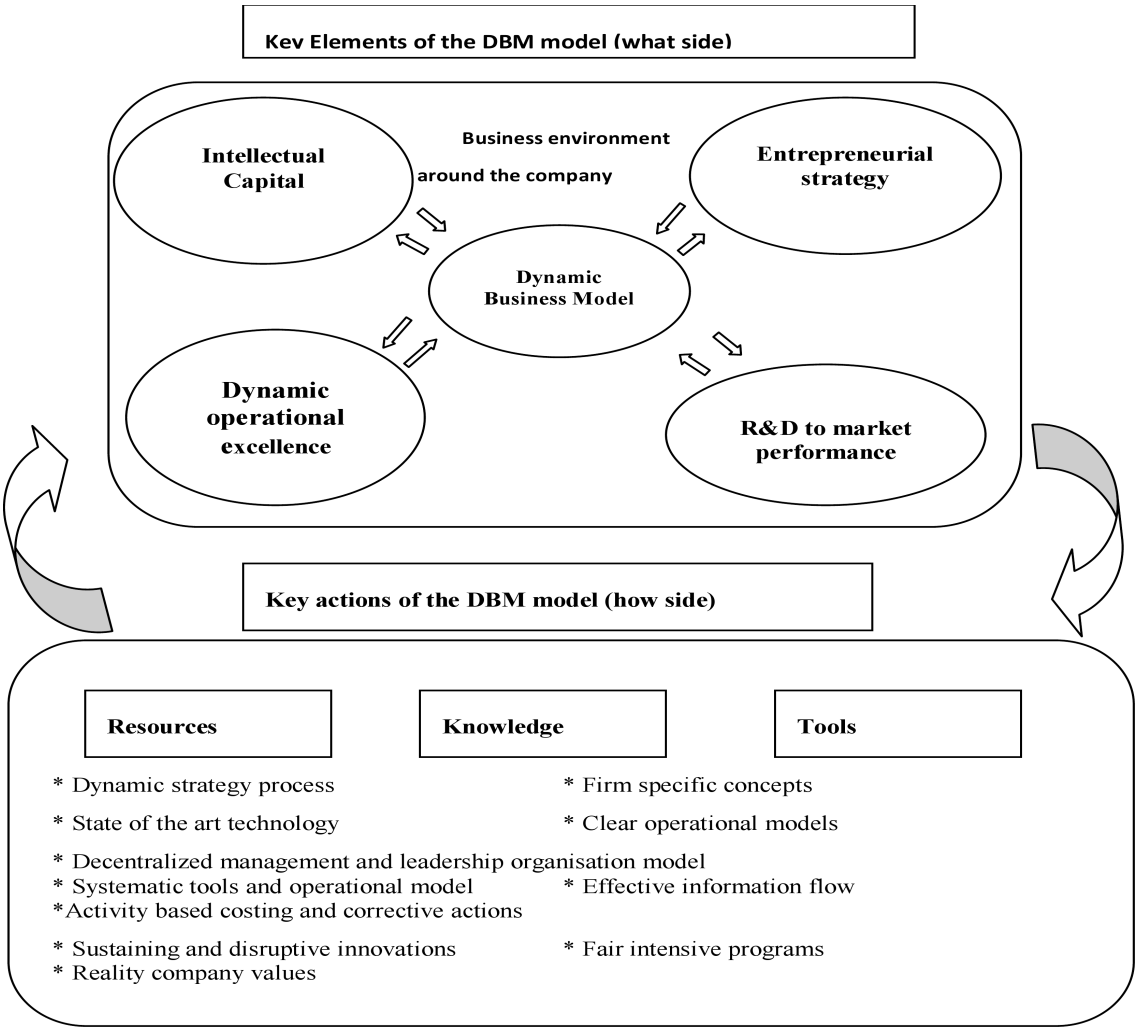

Fig. 5. Simplified Dynamic Business Model .

Dynamic capabilities in high technology power electronics field

Based on the analyses, previous studies, and interviews that were made, we can summarize following simplified model shown on the Fig. 5. First part of the figure shows the key elements and the second part shows actions that a firm should do to the key elements. The Fig. 5 also answers the first research question;

1^{st} Qn; is it possible to create an efficient business model for power electronics firms which have operations in a turbulence business environment?

Company should have resources, knowledge and tools to make possible those mentioned actions to see the day light. Resources are people, finances, knowledge, and tools, which are needed so that employees can do the right things in the right way.

Figure 5 shows the most significant high-level actions while more detailed model is introduced later in this section including the links between the key elements and values as well as sub values.

The model has been developed for power electronics industry in a turbulent complex environment with global business. The Fig. 5 shows how the model is working at a higher level.

This model further described in a detailed list description of success factors or classes under the dynamic business concept, which are considered to be the most important factors in high technology power electronics field. In bold words are classes and subclasses are marked with "sc", values marked with "v", and sub values marked as "sv". These letters are answering to the question on "what" and "how". The ontology list below answers to the second and third research questions:

2^{nd} Qn; What are the key elements of the model?

3^{rd} Qn; How could the key elements be implemented?

Dynamic Business Model (DBM)
1.0 Entrepreneurial Strategy (c)
1.1 Dynamic strategy process (v)
1.1.1 Demanding business target (sv)
1.1.2 Company specific (sv)
1.1.3 International business concept (sv)
1.1.4 Networking (sv)
1.1.5 Continuous Improvement (sv)
1.2 Firm specific concept (v)
1.2.1 Credible, Simple, Feasible (sv)
1.2.2 Product concept (sv)
1.2.3 Process concept (sv)
2.0 R&D to market performance (c)
2.1 State of the art technology (v)
2.1.1 Technology push products (sv)
2.1.2 Market Pull products (sv)
2.1.3 Appropriate product portfolio (sv)
2.1.4 Modular product platform (sv)
2.2 Clear operational model (v)
2.2.1 Concurrent engineering (v)
2.2.2 Cross functional "tiger" teams (v)
2.2.3 Fast time to market operations (v)
3.0 **Dynamic operational excellence (c)**
3.1 Decentralized Management and leadership organisation model (v)
3.1.1 Team work with high motivation (sv)
3.1.1.1 Meaningful work (sv)
3.1.1.2 Good working atmosphere (sv)
3.1.2 Flexible organization model with fair leadership (sv)
3.1.2.1 Global operations with local actions (sv)
3.1.2.2 Cross functional teams (sv)
3.1.2.3 "Tiger" teams (sv)
3.1.3 Fast decision making process (sv)
3.1.4 Right Partners (sv)
3.1.5 Systematic planning process (sv)
3.1.6 Trust (sv)
3.1.6.1 Openness (sv)
3.1.6.2 Empathy (sv)
3.1.6.3 Customer Loyalty (v)
3.1.6.4 New market segment (v)
3.2 Systematic tools and operational model (v)
3.2.1 Standardization (sv)
3.2.2 Modularization (sv)
3.2.3 Mass Customization (sv)
3.2.4 Product data management (sv)
3.2.5 Pull control (sv)
3.2.6 High amount of sales variants (sv)
3.2.7 Wide sales channel (sv)
3.2.8 Effective service process (sv)
3.2.9 Continuous improvement system (v)
3.3 Effective information flow (v)
3.3.1 Cloud computing systems (sv)
3.3.2 Global information sharing and data sourcing system (sv)
3.3.3 Automated data collection systems (sv)
3.3.4 Knowledge service system (sv)
3.4 Activity based costing and corrective actions(v)
3.4.1 Growth tracking (v)
3.4.2 Profitable tracking (v)
3.4.3 Financing tracing (v)
3.4.4 Sustainability resilience (v)
3.5 Creating, integrating, recombining and releasing resources (sc)
4.0 Intellectual capital (c)
4.1 Sustaining and disruptive innovations (v)
4.1.1 Process innovativeness (sv)
4.1.2 Product innovativeness (sv)
4.2 Fair Incentive programs (v)
4.2.1 Bonus system based on Firm's success (sv)

4.2.2 Everyone involved (sv)
4.3 Reality company values (v)
4.3.1 Work feedback (v)
4.3.2 Systematic tools (v)
4.3.3 Trust (v)
4.3.4 Fair play (v)
4.3.5 Firm's spirit based on success

Conclusion

The study in this paper suggests a model in Fig. 5 that can be used by organisations that are in power electronics industry, to be successful in a turbulent market environment. This model combines the theory of science and methodology. The models' methods and its paradigm have an influence on the research problem, and it is implemented in this research. The contribution achieved from the research, could suggest that, organisational management should have a competent entrepreneurial strategy that is unique.

Fresh ideas are necessary to be successful in changing business environment where, firm specific concepts together with software are generally running the most important role, making customization work easier, and creating a wider amount of product features. This means that it is possible to increase the revenue very fast by having no additional investment to the stocks. The Dynamic business model represent in the study suggests a new way of thinking and making it easier for managements to make the right decision in company perspective as well as customers' view. The model combines most important key elements, links actions to the key elements making it possible to create a more profitable business.

It appears that firm's size as well as globalization affects the importance of classes defined above. We can summarize that high technology companies operating on an international level need wider competence and knowledge platform than local companies. Some of the significant categories are listed below:

- Entrepreneurial strategy;
- R&D to market performance;
- Dynamic operational excellence;
- Intellectual capital.

Entrepreneurial strategy, effective processes, innovativeness, and dynamic capabilities, which take environment changes to the account, are one way to develop a more agile customer oriented company. Working in collaboration with customers and partners is crucial. It helps to understand the customer needs more deeply and to respond to the customers' demand faster; flexible, and more agile processes to support the changing customer needs. The aim of this study was to develop a business model and to analyze factors that are most significant in power electronic business industry. One of the key findings inside the model was the importance of efficient information flow in a global business.

Many other industries have similar challenges like power electronics industry presented in the study. For further studies, we recommend verifying the model in the start ups companies as well as within other industrial branches, which are technology and knowledge driven businesses with many products, delivered in a turbulence business environment.

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