

THE INFLUENCE OF A COMPANY'S STRATEGY ON CREATIVITY AND PROJECT RESULTS IN AN NPD – CASE STUDY

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ABSTRACT

There has been a great deal of discussion about how important creativity is for the process of new-product development. In the globalized, competitive world where there is a constant inflow of new consumer goods it is extremely important to establish a successful information network of knowledge sources (e.g., academia) and product producers (e.g., companies). The core of this network should become new-product developers who are being supplied with a real-time flow of accurate and proper information. The developers could be a company or academia placed, or either dispersed to some other locations. Since the developers rely heavily on information provided to them, it is essential to establish the appropriate level of trust and support between all the partners involved.

To simulate this kind of working environment, an international school called the European Global Product Realization (EGPR) was established. It connects students from several European Universities (in 2010 this was the University of Zagreb, University of Ljubljana, City University London and Technological University Budapest) into a design course with a different industrial partner involved each year. The industrial partners define the product specifications for the products to be developed and provide the information about the existing models in comparable families of products.

In 2010 we had the opportunity to host two companies at this course concurrently with two different development approaches. One company had a liberal view of the product-development process and gave the developers only basic product constraints at the beginning, while the other company set much tighter product constraints. Based on these constraints, the teams took different approaches to their new-product development. Some of those differences, which also had an effect on the results, are described in this article.

Keywords: NPD, virtual environment, design school, team work, creativity, motivation

1 INTRODUCTION

In the modern, globally competitive environment, successful companies will be those that develop products that satisfy customer needs better than the products of their competitors. Therefore, it is necessary that companies fully research such needs, and generate ideas and solutions that best respond to them. This requires a significant amount of creativity in the product-development process. If this creativity is correctly implemented in the innovation process, it can mean a decisive competitive advantage for the company [1].

Strategy and creativity in a company

Successful companies have evolved a systematic approach to adapting to the competitive environment [2]. This approach assumes that certain strategies are implemented in the activities of the company in relation to the unpredictable external environment [3]. It can be stated that the strategies adapted by a company are the main factors defining the company's interaction with the environment. At the same time, strategies also integrate the company internally, as they define the systematic adaptation of the company to all influences, with the intention of reaching specified goals [4]. In accordance with the strategy specified, different levels of power and cooperation among different business units in the company are specified, mainly according to the function the unit plays in its interaction with the external environment [2].

Miles and Snow [5] have defined three different strategy types, which differ mainly in the strategic choices made in the product continuum of the market:

Prospectors act proactively and constantly search for new market opportunities and possibilities for new-product development [3, 6, 7]. Most often they experiment with reactions to current market trends and compete aggressively by innovating [4]. They are the creators of change in their industry, and creativity is their main tool for keeping ahead of their competitors [6].

Defenders represent the opposite approach. Their focus is on maintaining a safe position in existing markets, and opportunity searching is not a part of their strategy [3, 6, 7]. They look for competitive advantages in quality improvements and lower prices. Differentiation and higher efficiency is their main goal [4]. Product development in companies with a defender strategy is based on product-line extension and an expansion into known environments. Environmental management and the management of trends are not the main concerns of defenders, as the environment is stable and does not affect the internal structures and functions significantly [6]. Innovation is limited to solving engineering problems, which is the reason why defenders mostly compete with ensuring a cost-effective core technology and administrative systems.

Analyzers are a combination of both the previously defined strategies. In their activities they search for a balance between assuring their position in existing markets and searching for their share in new markets. Their competitive advantage is based on differentiation and operational performance [4]. As defined by Miles and Snow [5], they are “avid followers of change” and their main activity is imitating and improving the best new solutions brought to the market by prospectors. In order to do this, constant interaction and information gathering from the environment is crucial. Therefore, the work of analyzers is defined by its duality [6]. In a limited marketing segment they effectively recognize customer needs and satisfy them with products of high quality. At the same time they are constantly following the development of prospectors, by researching their innovations and introducing new, improved solutions to new markets. Flexibility and fast reaction times play a vital role in the field of technology.

Any of the above strategies can lead a company to success if it is well implemented and in tune with environmental trends and uncertainties [1, 5]. But there is an essential difference in the creativity needed for reaching planned goals and defining further research goals. Defenders invest little in innovation, which reduces the need for creativity and idea generation during the first loop of the NPD process. Analyzers and prospectors, on the other hand, invest heavily in innovation, since they also have a greater need for creativity and idea generation. They both compete with innovative new products, where the starting point is defined by the creativity of the company [8, 9, 10, 11]. The crucial role in ensuring creativity in a company is played by top management, which defines the business strategy and consequently the innovation and development processes within the company [8].

2 PROJECT DESCRIPTION

To involve students into the process of new-product development (NPD) in a virtual environment and to establish a stimulating learning and working environment the concept of an academic virtual enterprise (AVE) has been invented [12]. It is a project-oriented educational agreement, which is based on the alliance of industrial and academic partners for mutual advantages. The industrial partner provides a problem to be solved by the international teams of students. They communicate through a video-conferencing system and other internet communication channels. The AVE connects academic and practical knowledge by solving a real-life NPD problem. Its main characteristic is the formation of virtual teams of students that only know each other through the video-conferencing meetings. All the communication and work in such an enterprise is done with the help of internet technologies, as the participants are located in different parts of the world.

The result of a cooperation between several European Universities (in 2010: University of Zagreb, Ecole Polytechnique Federale de Lausanne, University of Ljubljana, City University London and Technological University Budapest) is an international AVE called the European Global Product Realisation (EGPR) design course, with a different industrial partner involved each year. The industrial partners define the product specifications for the products to be developed and provide the information about the existing models in the comparable families of products.

The goal of EGPR courses is to enable students to develop the capabilities that are needed to solve complex real-life NPD problems, to generate product ideas and forward them to the status of a working-product prototype and to manage their knowledge inquiry and skill development for their

future work as professional designers [12]. Through the EGPR course the students work in multicultural, multinational and multidisciplinary teams. Knowledge is built and exchanged by the communication and collaboration of the various participants (students, company experts, instructors, lecturers, researchers, industrial partners, end users) via various forms of interaction and inquiry [12]. The EGPR course comprises several steps, such as market analyses, financial issues, product specifications, vision formation, concept generation, concept solution, materialization, prototyping and testing [13]. Teams are formed in such a manner that each team consists of several students from each of the participating universities. Therefore, the profiles of the students in a team are very different. On the one hand, this has the advantage of providing the complementary knowledge and expertise that are needed for the development of a global product and, on the other hand, it poses the problem of handling the discrepancies, not only in skills and expertise but also in viewpoints about the same subjects [13].

In the school year 2010, Ljubljana hosted two different industrial partners, which also introduced two different company strategies. The first company (Company A) is specialized in thermoplastic production, namely sanitary equipment. This means that the company takes its share in a very conservative and mature market field, and so was its approach towards the course with the definition of the task and the response of the company representatives. From the beginning the company took completely the defender's approach. However, after a discussion with academic staff, who had several years of experience in NPD and this course, the company changed its position into that of an analyzer. So, at the beginning the company wanted to follow the leading solutions of the major competitors, trying to optimize the existing solutions in order to achieve better economic results on the market. However, after the discussion the final task definition still meant following certain standards and trends in the market, but overall the task gave students space to explore new technologies and solutions to replace existing conservative working principles in the whole chain of relevant products.

On the other hand, the second company (Company B) is a member of a leading multinational group and produces small household appliances. They are extremely aware of the importance of creativity for success in the market. Therefore, their task definition specified only a few starting points and a market niche, while there were no technological or other constraints. The company representative even insisted that the students did not follow any standards or directives.

To evenly distribute the students and tasks, three teams of 6-8 students worked on the Company-A project and the other three student teams worked on the Company-B project.

3 RESULTS

The whole NPD process was monitored by coaches using qualitative and quantitative questionnaires. In this paper we focused only on the realization of the project, and analyzed the reasons for the results.

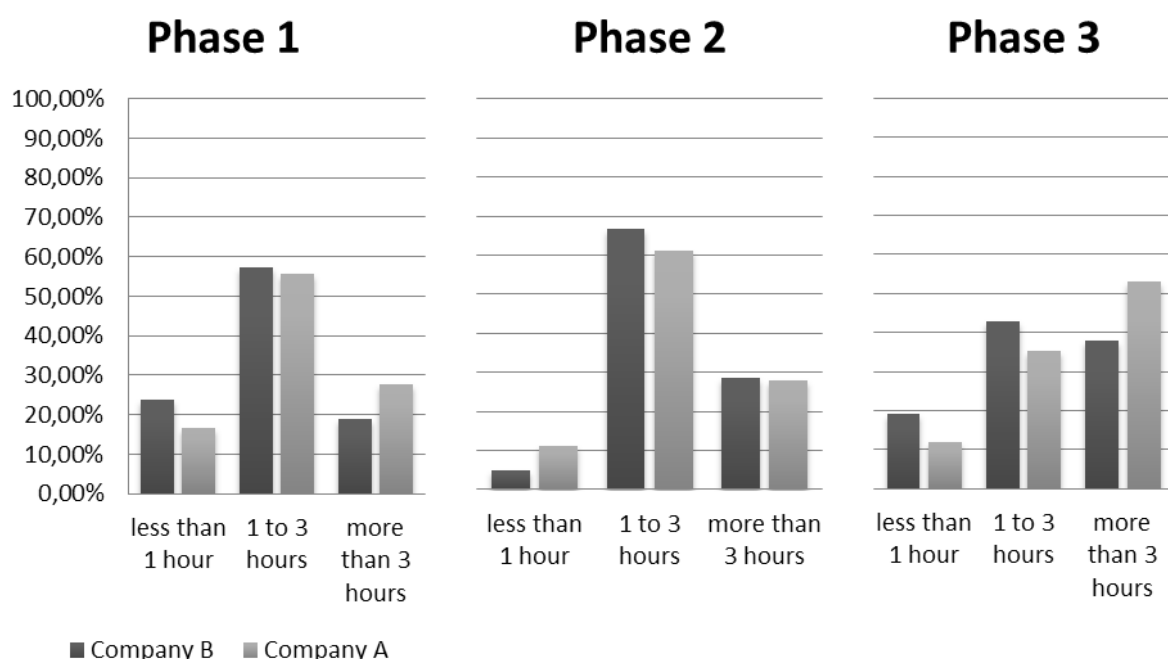


Figure 1. Daily amount of time, spent on the project during different phases of the project

The first issue that we analyzed was the time spent for each phase of the project. Figure 1 (left) shows that the team members working for Company-A needed more time than the others. The strictly constrained task demanded much more effort to find the appropriate idea to work on. Or as one of the students said in the questionnaire: *“I also think that the company doesn’t appreciate ‘out of the box’ ideas and they care more about activating plate than anything else”*. On the other hand, the project constraints also limited the second, creative phase, which gave less space for creative concept deviations. Therefore it took less time for Company-A students to complete the second phase (Figure 1 – middle). One of the students said that the biggest challenge of this phase was: *“to create enough ideas, because our project is very limited”*. However, in the third, realization, phase a lot of questions remained, therefore, unanswered or some problems were difficult to solve. That increased the demand for additional time that was dedicated to the project by the Company-A students (Figure 1 – right). This statement can also be supported by the results shown in Figure 2, which indicate that most of the Company-B students had adequate time to complete the prototype, while one third of the Company-A students claim that they would need more time to complete the prototype as they intended to.

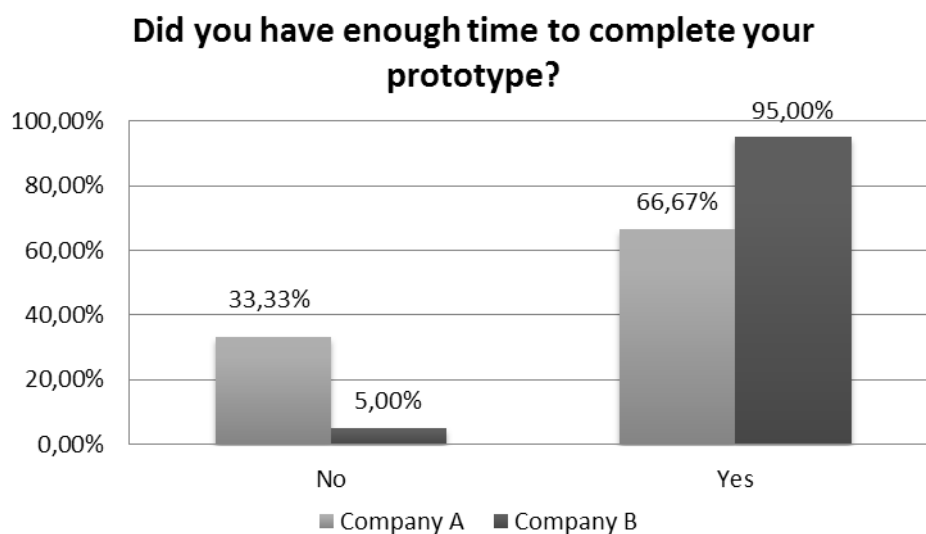


Figure 2. Time available to complete the prototype.

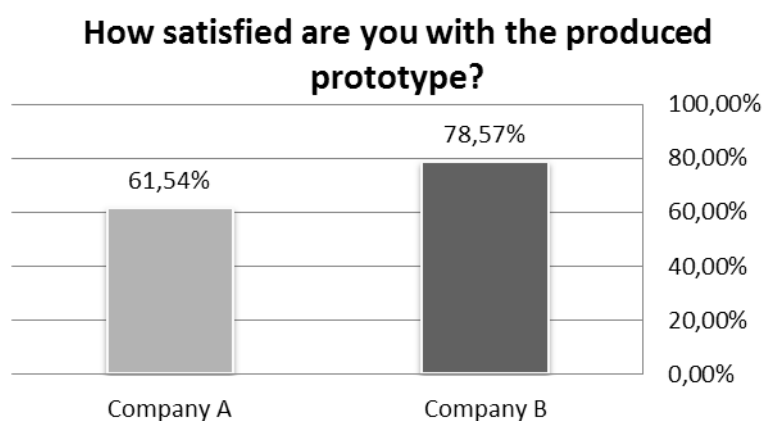


Figure 3. Satisfaction with the produced prototype.

All the previously mentioned results are also reflected in the perfection of the produced prototype. The time-demand structure of the Company-A project resulted in some last-minute technical problems, which in two cases caused prototype malfunctions, and uncompleted details of the prototype. On the other hand, all three Company-B teams completed their tasks successfully and were consequently more satisfied with the produced prototype, as can be seen in Figure 3.

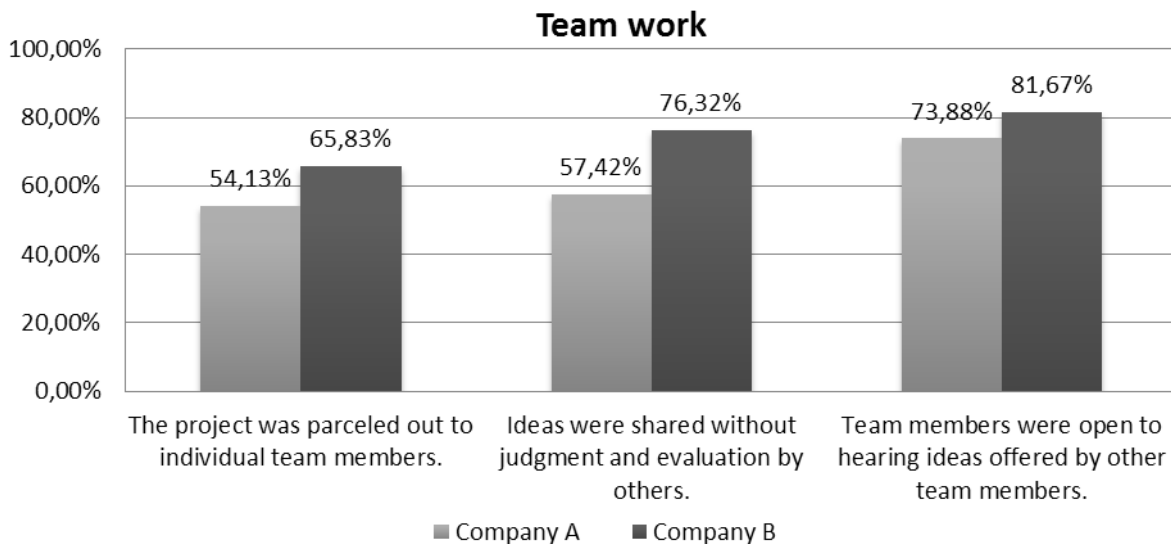


Figure 4. Team work: task distribution among team members (left); Freedom of idea sharing (middle); Curiosity of team members for other's ideas (right).

The working conditions within the teams had a great impact on the creativity and the results. It is crucial that the team members feel comfortable to express all their ideas without the fear of being judged by other team members or even demoralized. To analyze is the level of stimulation in the working environment of the teams to produce new ideas we defined three different questions. First we wanted to know to what extent the team worked as a cluster of individuals. The results show that in the more prospective environment the team members worked more as individuals. Although the value is only about 10% higher than in analyzers' environment, the difference also remains through the other two questions. Almost 20% more ideas were shared without judgment within the Company-B teams than within the Company-A teams. However, the percentage of team members from both cases, claiming that they are open to hear ideas by other team members is even higher, regardless of the company's strategy.

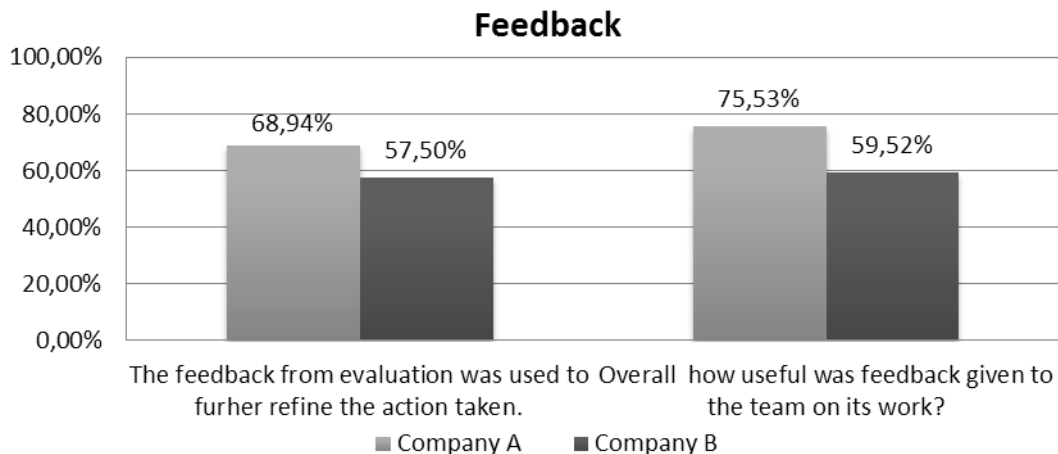


Figure 5. The role of feedback in different creative environments.

The most surprising results of this research were those regarding the company feedback. Company-B team members, which were left unlimited, relied on the feedback from the company to a much lesser extent than those working on the Company-A project. The latter teams found the feedback more useful and used the data accordingly (Figure 5).

Based on these results we assume that the analyzer's strategy leads to (but does not necessarily mean) the involuntary dependence of the team, which works on the project, on the project owner, i.e., the company. This becomes evident when considering the student response to the questionnaires like: "I hope that the company will be more involved in this project and could give us more feedback about

our work”, or that they missed “*the knowledge from ‘the Company A’, which includes calculations for flow rates as well as the relevant standards*”

4 CONCLUSION

In this paper we investigate the influence of a company’s development strategy on the results of a new-product development in teams that are working in a virtual environment. The investigation examples are taken from an international student-development project, called EGPR, which last year concurrently involved two different industrial partners.

It is commonly believed that the prospecting company strategy has a positive influence on the creativity and development process. This was mostly confirmed by our study, as well.

However, we found some surprising results. The company’s strategy influenced not only directly on the creativity, but also on the team’s organization and the demand for control. From the questionnaires we noticed that in the analyzing environment the team members judge and evaluate the ideas more than the members in the prospecting environment. The demand for feedback from the company is also higher, if the company firmly sets the task constraints. We believe that these differences originate in the differences between the two different strategies that were taken. In the firmly constrained environment the ideas are immediately being judged by other team members according to those constraints, although team members are open to the ideas of others. The constraints in the analyzers’ environment seem to demand the stronger cooperation of team members to set the common team’s position and argue the team’s decisions against particular constraints. We also noticed a higher demand for feedback in the analyzing environment of the Company-A than in the prospecting environment of the Company-B. Therefore, A-teams wanted to know the company’s position and opinion before the teams argued their statements and decisions.

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