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Editor's Introduction to Volume 2, Issue 2 of Expert Journal of Business and Management

Simona VINEREAN*

Sprint Investify

The second issue of the second volume of *Expert Journal of Business and Management* presents interesting articles that explore business and managements issues in terms of the exploring the organizational culture and strategic directions in Montenegro, decision making process in the tourism industry, the implications of the implementation of the 3D CAD software in business operations of new product development teams. Thus, the topics and research methods presented in this issue make meaningful contributions to business knowledge and offer a wide range of perspectives from different countries. Further, I present a short description of each article published in *Expert Journal of Business and Management*, vol. 2, issue 2.

In *Organizational Culture and Its Implementation in the Choice of Strategic Option - Case Study Montenegro*, Nikčević (2014) explores how organizational culture has an impact on choosing and implementing strategies in 16 companies from Montenegro, leading to a comprehensive study of 324 respondents. Moreover, the selection and implementation of a certain strategy through different mechanisms may reinforce or change the existing organizational culture. Management research shows a cause-effect relationship between organizational culture and overall performance and in this line of ideas, the author offers theoretical explanations of this relationship and examines it empirically. In terms of theoretical contributions, Nikčević defines the concepts and presents their significance and content in business management, and then showing empirically that there is a statistically significant connection between organizational culture and the way companies won the competition in the market.

In her paper *Consumption Habits During the Decision Making Process in Tourism*, Vinerean (2014) provides insights on the habits of consumption and patterns that interfere in the decision making process in tourism, as a result of all the changes which appear in the social and economic environment, at a global level. Using a quantitative research in an empirical analysis, the author studies the views of Romanian tourists in terms of the needs and patterns of the consumers and consumer preferences and requirements. This paper on tourists' predisposition to purchase and the patterns that are usually decisive in the decision making process regarding tourism services is of particular interest of tourism businesses and agencies eager to investigate continuously their market in order to better understand the behavior of tourists and offer them those products and services that reflect their needs, desires, and predispositions.

Staita (2014 a, b) examines in his two published articles the implications of the implementation of the 3D CAD software in business operations of new product development. In his first paper, *Coherent Division of Labor in a Three-Dimensional CAD New Product Development Environment*, Staita (2014a) studies the strengths and weaknesses of the 3D CAD software and how the use of it has had repercussions on

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the life of engineers. In this framework, the author develops a model of establishing an adequate team structure that considers the engineers and the efficiency of the software for the performance of a company, by analyzing the different tasks that can be carried out. To set up a new model, Staita (2014a) starts from a hypothesis that the employment of technical draftspeople for the setting up of technical drawings and product documentation, increases the economic and the socio-psychological efficiency of mechanical development departments in medium-sized companies.

In his second article, *Performance Improvement by Functional-Respectively Competence-Diversity in New Product Development*, Staita (2014b) studies the premises of competence diversity and familiarity that are essential to make a cross-functional team successful, particularly for the new product development teams. The author asserts that diversity in a team is not by nature really qualified to establish the intended collaborative climate. To create competence diversity is not only a global organizational task, Staita (2014b) advises that management must in parallel integrate this requirement adequately into single productive units to enable efficient work and in this respect he proposes a causal model that exhibit different relationships between different team constellations in NewPD teams under 3D CAD conditions and the economic and the socio-psychological efficiency.

References

- Nikčević, G., 2014. Organizational Culture and Its Implementation in the Choice of Strategic Option - Case Study Montenegro. *Expert Journal of Business and Management*, 2(2), pp. 37-46
- Vinerean, A., 2014. Consumption Habits During the Decision Making Process in Tourism. *Expert Journal of Business and Management*, 2(2), pp. 47-53
- Staita, C., 2014a. Coherent Division of Labor in a Three-Dimensional CAD New Product Development Environment. *Expert Journal of Business and Management*, 2(2), pp. 54-61
- Staita, C., 2014b. Performance Improvement by Functional-Respectively Competence-Diversity in New Product Development. *Expert Journal of Business and Management*, 2(2), pp. 62-71



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Organizational Culture and Its Implementation in the Choice of Strategic Option - Case Study Montenegro

Gordana NIKČEVIĆ*

University of Montenegro

The topic of this paper is to examine the influence of organizational culture on determination and implementation of the appropriate strategy within the company. Specifically, the author has tested the hypothesis about the influence of organizational culture on determination of strategy in Montenegrin companies. Firstly, in the theoretical part of the paper, the author defined organizational culture and business strategy and then analyzed the nature and manner of influence of organizational culture on formulation and implementation of strategy, as well as influence of implemented strategy on organizational culture. Organizational culture affects formulation of strategy determining information gathering, perception and interpretation of the environment. Namely, culture can facilitate or prevent implementation of the strategy through legitimization process. In the same way, the application of chosen strategy may, through its institutionalization process, reinforce or change the existing organizational culture. The empirical part of the paper refers to research results and testing of hypotheses about the influence of organizational culture on strategy of companies in Montenegro carried out on sample of 16 companies (324 respondents) in Montenegro.

Keywords: *organizational culture, business strategy, strategic management, Montenegro*

JEL Classification: M14

1. Introduction

The organizational culture affects almost every aspect of company's business operations by its influence on employees' interpretive schemes. This influence may be observed through a large number of factors affected by organizational culture like determination of appropriate strategy, control systems within the company, leadership styles, models of organizational structure, organizational changes, knowledge management, job satisfaction, motivation, leadership style, communication, etc. Many studies point to a causal relationship between organizational culture and organizational performance where it can be "a magic wand for the success" and "a silent killer." Regardless of different opinions regarding organizational culture, there is general agreement about its crucial influence on the success of the company, except that some factors may be affected more and some of them less (Saffold, 1998, 42-48).

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The importance of organizational culture and its influence on business operations of the company arise, among other things, from its role in the process of formulation and implementation of business strategy within the company. The strategy is very important plan decision that has a decisive success on company's business operations. The influence of organizational culture on business strategy of a company may be observed through three very important areas, such as: the content and nature of the strategy, the process of strategy formulation and implementation process of the same. Studies that analyzed influence between companies' strategies and their organizational culture point to a conclusion that there is mutual cause-and-effect relationship between these categories. Notwithstanding the fact that remains unclear what is the cause and what is the consequence in this relationship, studies have shown that organizational culture affects both the formulation and the selection and implementation of a business strategy. Likewise, the selection and implementation of a certain strategy through different mechanisms may reinforce or change the existing organizational culture. What remained less known in theory and practice are the nature and mechanisms of organizational culture and strategy (Klein, 2011).

Regardless of large number of papers published with regard to this topic, this problem has been rarely empirically researched and reviewed so far. Therefore, the aim of this paper is, in addition to theoretical explanation of mechanisms through which organizational culture influences the business strategy, to set up the hypothesis about the influence of organizational culture on the strategy that will be empirically tested. The paper first defines organizational culture and presents its significance and content. The strategy and types of strategies that will be used in research are defined thereafter. Then follows a theoretical explanation of the manner the organizational culture influences the business strategy. The hypothesis about implications of certain types of organizational culture on business strategy in Montenegro is set at the end.

2. Definition, content and importance of organizational culture

Organizational culture is difficult to define precisely, i.e. there is no single definition of organizational culture. It can be said that some of definitions are more recognized and some less, but neither of them is generally accepted. The organizational culture includes the "system of assumptions, beliefs, values and norms of behavior that members of one company have developed and adopted through common experience, which are manifested through symbols that guide their thinking and behavior" (Janićijević, 2013, 4-7). From the above stated definition three important components necessary for better understanding of organizational culture arise. First, organizational culture consists of collective cognitive structures such as assumptions, values, norms and attitudes, but also of symbols which materialize and manifest its cognitive content. Second, organizational culture is the result of organization members' common experience in solving problems they face with in dealing with external adaptation and internal integration of the collective. Third, collective cognitive structures that make organizational culture represent a framework and become a guide for members of the company in interpretation of reality and the world around them. Culture helps members of the company in determining the meaning of concepts, things and events within the company and outside of it and act in accordance with them.

For better understanding of organizational culture definition it is necessary to know its characteristics. Organizational culture is a social phenomenon since it is expressed at the level of a certain social group in the process of social interaction. Building organizational culture represents a long-term process, because it is changed hard and slowly. One part of its content is of subconscious character which makes this process more difficult. Further, culture as a combination of single experiences of members of an organization makes an organization different from others. Since it determines the meaning of events and things by its meanings, organizational culture provides a sense of certainty and order in them (Alvesson, 2002).

Organizational culture has its cognitive and symbolic component. Cognitive component comprises elements of interpretive schemes of managers and employees that are imposed by the company and through which it affects not only the way they behave, but also the way they understand the world around them. Cognitive components of organizational culture are: assumptions, values, norms and attitudes (Brown, 1998).

Basic assumptions explain the world as it is to the members of the company. Basic assumptions arise when solutions to problems the members of the company are facing with and which proved to be successful, gradually become the rules of how to behave in certain situations. Out of these problems solutions that proved to be successful, explanations of how the reality in which these problems arise works, are gradually developing. Those explanations are the basic assumptions as the deepest element of organizational culture (Schein, 2004).

Values are defined as "stable belief" that a particular behavior is more desirable than the opposite behavior. Values are defined as durable, extremely positive attitude to underestimated objects that we access as important. Values guide employees' behavior and influence the formation of their attitudes (Rokeach, 1973).

Norms are often included into the content of organizational culture, but always within the value. On the one hand, norms are largely overlapping the values they arise from and the practice of behavior they determine, on the other. That is the reason why norms represent connection between values and behaviors. Norms are rules of behavior, often informal, deriving from values and represent guidelines for everyday behavior of company's members (Kotter and Heskett, 1992).

Attitudes are based on and derived from values. However, attitudes generate behavior in a slightly different way from the norms. In contrast to the norms that represent certain rules that lead behavior of employees in the company, the attitudes represent beliefs about the object of behavior that will produce certain behavior towards the object. "The attitudes include basic ideals and principles of business conduct" (Žugaj, 2004, 13-15).

Cognitive content of organizational culture is made of invisible culture elements. Symbolic components of organizational culture manifest cognitive elements of organizational culture and include everything that can be seen, heard and felt in the company (Bouman, 2003).

The importance of organizational culture arises from the fact that it largely determines the meaning attributed to events and occurrences, both within the organization and outside of it, by members of an organization. So it is a system of assumptions, values, norms and attitudes that are shared by all members of the organization, employees and managers of the company, which essentially determines their thinking, behavior and influences their decisions and actions. Therefore, all decisions, both of managers and employees in an organization, are to a large extent determined by culture. In that sense, organizational culture affects not only strategic decisions of top management but also operational, i.e. everyday decisions within the organization (Kotter and Heskett, 1992).

3. Business Strategy

"Strategy is a planning decision on basic ways of achieving company's goals" (Milisavljević, 1997: 27). According to Robbins strategy is "a broad concept of behavior which sets out manners of achieving goals" (Robbins, 2005: 35). Strategy is the most important planning decision through which a company is managed, i.e. company's objectives realized. The strategy shows the extent to which a company managed to harmonize its skills and resources with the environment in which it operates. It is a dynamic process through which a company seeks to take advantage of all opportunities and avoid the dangers. In this sense, we say that the strategy is not formulated in advance, but it must be formulated (Đuričin et al, 2012).

Determining of company's strategy means choosing one of strategic options. The company needs to make the right strategic choice that will allow it to achieve its goals, and thereby take advantage of opportunities and avoid dangers from the environment. The company can do this through: (Porter, 1980)

1. Positioning - meaning to position its resources and activities in such a business environment in which the influence of unfavorable factors or circumstances is the weakest.

2. The influence on the balance of given factors - representing the impact of certain factors. Namely, in an attempt to improve its positions through various types of innovations, the company can develop business in a particular industry, thereby improving its position.

3. Strategy of timely use of new opportunities. This strategy is based on the fact that a company recognizes and takes advantage of its opportunities before others do. The company will choose a strategic option that will enable it to achieve a competitive advantage. In this sense, strategic choice should be focused on:

- efficiency of capitalization, which means provide the position in the industry through cost and pricing advantage,
- differentiation of its offering in order to move the demand curve in favor of own offering through promotion of difference of its own products compared to other competitive products,
- orientation on an enough large market segment with the expectation to strengthen itself in a given market and provide a competitive position through activities marketing.

Basically, as it has already been mentioned, there are three basic strategic options available to organizations for gaining competitive advantage. These are: Cost Leadership, Differentiation and Focus. Which of strategies will the company choose depends on the structure of industry, demand and possibilities of a company.

According to Miller and Dess (1996) a cost leadership strategy is based on abilities and expectations of the company to gain competitive advantage as a result of lower costs because the same product is offered at lower prices. In fact, it is the pretension of a company to build the position of its business within a given industry, through the possibility of gaining competitive advantages based on lower costs and selling prices. Namely, a company expects that, using economy of scale it will gain cost advantage that allows it to provide greater market share due to lower selling prices. Product differentiation represents orientation in which a company seeks to make the same product different from competitive ones through functional and aesthetic properties of the product. Doing so, the company expects to provide affection and loyalty of its customers to the brand of its products. Market Focus is a strategy that starts from the assumption that the market is not homogeneous but that is made of larger or smaller number of recognizable parts. The essence of this strategy is that a company strengthens its position by engaging in certain market segments. That is, the focus here is on the narrow market or on one enough large segment where the position will be provided through either differentiation or lower selling prices (Hill and Jones, 1989).

It is important to mention the so-called stakeholders of a company that can significantly influence the choice of business strategy of the company. They function in sense to provide the necessary resources and services for the company, and in return they expect their goals to be adequately met. The following are the above mentioned stakeholders of the company: shareholders, customers, suppliers, etc.

4. The influence of organizational culture on business strategy

The impact of organizational culture on the strategy is reflected in phases of formulation and implementation of an appropriate strategy (Janićijević, 2013: 291-297).

Process of formulation of the strategy consists of the following phases: analysis of external environmental factors, analysis of internal factors of a company, generating of strategic alternatives, evaluations and selection of the best strategy. In the process of strategy formulation, the environment in which the company operates, i.e. opportunities and dangers that come from the environment must be examined first. The company observes events in the environment, interprets them, determines their significance and makes further forecasts. Then it is necessary to analyze internal capabilities of a company, which includes an analysis of material, financial and human resources in the company. Starting from these resources, a company will identify its own strengths and weaknesses with respect to competition. Based on internal and external analysis, a company will generate those strategic options that best align company capabilities with the situation in the environment. These options should enable a company to exploit its opportunities and avoid dangers that come from the environment, i.e. to exploit the strengths and minimize the weaknesses. In the next phase, a company evaluates strategic options and makes selection of the best. The company will choose those strategic options that contribute to the great extent to the achievement of strategic goals of the company.

The impact of organizational culture on business strategy, as it has been said, is reflected in the process of strategy formulation. In this regard, the organizational culture affects strategy as follows:

1. Organizational culture determines the way in which the company monitors its environment. What information a company will collect from the environment and what picture of the environment it will build in the process of external analyses depends on company's manner of collecting information. By its assumptions, values and beliefs, organizational culture determines the sources and manner of collection of information. Therefore, whether a company will choose qualitative or quantitative information and how it will monitor the environment depends on organizational culture, i.e. values and beliefs of employees and managers of that company. If the company is dominated by relations of openness and flexibility towards the environment, a company will have more developed practice and mechanisms of monitoring environment in relation to closed and less flexible companies. However, organizational culture affects not only the external but also the internal analysis of a company. Evaluations of resources and capabilities in a company also depend on values and beliefs shared by employees and managers.

2. Organizational culture causes selective perception of events in the environment. Through mental patterns and interpretative schemes of employees, organizational culture affects perception in the process of making strategic decisions. This scheme represents a systematic knowledge of an individual of certain phenomena and helps him/her to interpret events around him/her. As known already, organizational culture, by its assumptions, values and beliefs determines a significant part of employees' mental patterns in a company. However, people have tendency to anticipate certain events that are not in accordance with their mental patterns. Such information is more difficult to remember, but is very easy and quickly forgotten. Since part of these patterns is determined by assumptions and values of organizational culture, it means that

organizational culture represents a kind of a filter through which some information passes and some does not. Thus, organizational culture as such affects the people to see certain phenomenon and not to see the others. This can lead to significant errors in strategic decision making. That is why selective perception represents a cause for many failed investments, because in deciding to enter into a certain project some people take into account only those facts that support the chosen option, while rejecting others.

3. Organizational culture directs interpretations of events in the environment. To make decisions in a company to have an impact on formulation of the strategy, it is necessary for them to be interpreted in a way that will cause certain effects. Interpretation and explanation of these events depends on the mental patterns and experience of those who participate in the formulation of strategy. Given that a large part of mental patterns derived from organizational culture, it can be concluded that culture is a factor that determines the manner of how the internal and external factors of strategic choices would be understood and interpreted.

4. Organizational culture determines the reaction of a company and its choice of strategic option. If there is an agreement about the manner of interpreting information from the environment and their meaning, it does not mean that there is an agreement in which direction to direct actions and choose a certain strategic option. Direction in which activities should be focused in the selection of certain strategic option also depends on the assumptions, beliefs and values that prevail in organizational culture.

In the implementation phase culture can be a stimulating factor, i.e. it can support the defined strategy or represent its serious obstacle, when we say that culture does not support the defined strategy. To what extent culture will or will not support the defined strategy depends on degree to which organizational culture agrees with the chosen strategy. To implement the strategy it is necessary to take certain activities. In this regard, two situations may arise. The first is when undertaken activities are in accordance with cultural assumptions, values and norms and we say that the strategy is easy to implement in the company. Formulated strategy is not only compatible with the existing organizational culture, but is also a stimulating factor for implementation of a strategy and legitimizes the chosen strategy. Another situation is the case when the formulated strategy is incompatible with the existing organizational culture (due to pressure from the environment, change in leader and his associates, where new management formulates the strategy that contradicts the values and beliefs of the majority of employees and managers in the company or acquisition that represents the situation where one company acquires another, so the bought company usually changes its strategy and accepts the strategy imposed by the new owner). This results in implementation of such operational activities that are not in accordance with cultural assumptions, values and norms of behavior, i.e. they are not culturally acceptable for the company. Such activities are not easily to implement and we usually say that in such a case the culture becomes a barrier to implementation of the strategy and delegitimizes the same. This situation is referred to as a cultural risk. To reduce a cultural risk a company must behave in different ways: (Schwartz and Davis, 1981)

- It may ignore culture, which is not recommended, unless it is a small and young company where management still believes that the defined strategy will shape culture.
- It may adapt culture to the strategy. It happens when the new management wants to impose a new strategy for taken over company. Implementation of this procedure is quite expensive and uncertain. Namely, it may happen that the time required to change culture is much larger than the time required for application of the strategy. That is why it is much easier when only certain norms of behavior are changed and not culture in whole.
- It may adapt the strategy to adapt to culture, which is used in a situation where merged companies change their strategies that are not in accordance with organizational culture of the company that merged them.
- It may change implementation strategy plan, which represents situation where the strategy is of essential importance for the company and where culture cannot be adapted to the strategy. Then the company will retain the existing strategy, but it will change the implementation strategy plan and adapt it to culture itself.

Therefore, the influence of organizational culture on business strategy has been explained in the previous part of the paper on a theoretical level. In the following part the hypothesis about the influence of organizational culture on business strategy in Montenegro will be examined. In this regard, we started from the hypothesis that:

~ Organizational culture affects the choice of strategy in the company ~

4.1. Research methodology

The research was carried out on sample of 16 companies in Montenegro, of which 8 were private-owned (50%) and 8 state-owned companies (50%). It included 324 respondents, of which 165 (50.9%) are employed in private-owned companies and 159 respondents (49.1%) in state-owned companies. Respondents were selected randomly. A total of 400 questionnaires were distributed of which 76 questionnaires were not returned (5 questionnaires in 12 companies and 4 four questionnaires in 4 companies) so that the research eventually

included a sample of 324 respondents. Companies were of different sizes, performing different types of activities (manufacturing, trading, service) and of various technical and technological level of development. When selecting a sample, we have tried to secure presence of all categories in order to make a reliable conclusion. In this context, attention was paid to facts that respondents are of different sexes, different work experience, level of education and that they are employed in different positions, all in order to examine a diverse sample and obtain more extensive and more accurate results. Therefore, we provided that the structure of sample corresponds to the structure of company's employees. Quite diverse and differentiated sample dictated breadth and depth of the research. The research was conducted using the classic survey method, i.e. a standard questionnaire method. In addition to primary information collected by the survey, in order to get acquainted with the factual situation, informal contacts with the management of companies were of significant benefit. Efforts of a research carrier in the course of research to get familiar with actual and specific situation in the company as well as with the potential problems that occur in the company were of relevant help. Prior to carrying out a questionnaire, the researcher made a deal with the management representatives to ask employees in writing to participate in the research. The same was done in all companies encompassed by the research.

We first determined the type of organizational culture that dominates in companies encompassed by the sample in studying the impact of organizational culture on business strategy. This part of the questionnaire identified, according to perception of the respondents, the type of organizational culture present in companies in the sample. For the purposes of this research, we used Harrison's test for diagnosing the type of organizational culture. This part of research includes 15 multiple choice questions each with four possible answers (a, b, c and d). Respondents were asked to rank given answers numbering them from 1 to 4, assigning number 1 to an answer closest to their opinion, and so on. By summing up the ranks, especially under a, b, c and d, we get the type of organizational culture of a certain company. For classification of the types of organizational culture, we used Handy's classification of the types of organizational culture that differs power culture, role culture, task culture and support culture (Handy, 1996). Therefore, answers under "a" implicate power culture, "b," role culture, "c" task culture and answers under "d" implicate support culture.

4.2. Research results

According to ranking of certain types of organizational culture, perception of each respondent as to what type of organizational culture belongs to his company was determined. Of the total of 324 respondents, the largest number, i.e. 41% of respondents perceived presence of power culture in their companies, 32% perceived task culture, 22% role culture and 5% of respondents perceived presence of support culture in their companies.

Table 1. Type of organizational culture

Type of culture		Number companies	Structure of the company
	Power culture	3133	3
	Task culture	0104	
	Role culture	772	
	Support culture	115	
	Total	3324	

Source: Author's analysis

Further research relates to the type of strategy that applies to companies included in the sample. In analysis of business strategy of the company and for the purposes of this research we decided to classify strategies according to M. Porter (Todorović et al., 2000: 278), under which we distinguish the following strategies market segmentation, according to which the company, taking into account differences among consumers focuses its operations on one or more market segments, cost leadership and differentiation strategy.

Since the type of organizational culture is a categorical variable with four modalities (role culture, power culture, task culture and support culture) and the issue relating to the strategy is also a categorical variable with two modalities (one market segment and all market segments), we used the Chi Square Test to examine their mutual relations. Statistical significance is measured at 0.05 and 0.01 levels, or the confidence based on 95% and 99%. Therefore, organizational culture has no influence on the decision of the company to opt for one or more market segments when choosing appropriate business strategy ($\chi^2=2.824$, $p=0.420$). Namely, the data obtained showed that out of 72 respondents in role culture, 29 of them (40.3%) believe that in choosing business strategy their company is oriented to one market segment, and 43 (59.7%) of them are still oriented to all market segments. In power culture 53 respondents (40.5%) opted for one market segment, and 78 (59.5%) for all market segments. In task culture 32 respondents (30.8%) opted for one market segment, and 72 (69.2%) for all market

segments and in support culture 5 respondents (33.3%) opted for one, and 10 respondents (66.7%) opted for all market segments when choosing business strategy in their company.

Table 2. Type of organizational culture * the choice of bussiness strategy in the company

Type of strategy			Type of organizational culture				Total
			Role culture	Power culture	Task culture	Support culture	
When choosing business strategy your company is oriented to:	One market segment	Total	29	53	32	5	119
		%	40.3%	40.5%	30.8%	33.3%	37.0%
	All market segments	Total	43	78	72	10	203
		%	59.7%	59.5%	69.2%	66.7%	63.0%
Total		Total	72	131	104	15	322
		%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	2.824	3	0.420
Likelihood Ratio	2.859	3	0.414
Linear-by-Linear Association	1.877	11	0.171
N of Valid Cases	322		

Source: Author's analysis

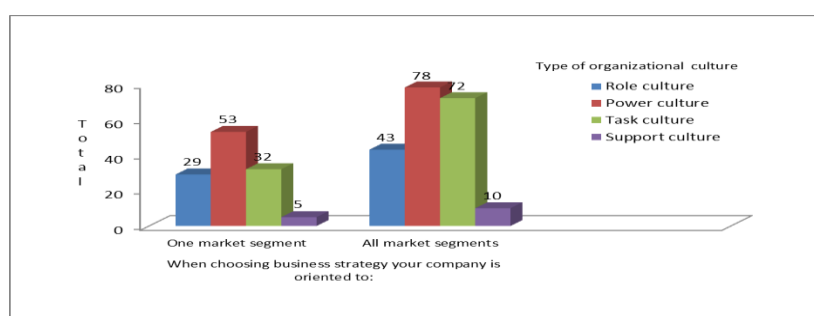


Figure 2: The choice of bussiness strategy in the company

Source: Author's analysis

In this part of the research, besides market coverage, we checked whether the organizational culture affects the choice of one of the two competing strategies, such as: cost leadership strategy and product differentiation strategy. The cost leadership strategy implies that the company, thanks to lower costs, offers a product at prices which are more favorable than the competing ones. Differentiation strategy refers to the fact that through physical and psychological differentiation of own from similar products, the company gains greater customer loyalty and more room to maneuver pricing policy. In order to understand how the company won the competition according to the aforementioned classification, the company may opt for cost leadership or product differentiation strategy. The results obtained show that there is a statistically significant connection between the aforementioned strategies and the type of organizational culture ($\chi^2 = 10.80$, $p = 0.013$), i.e. different cultures imply the use of different strategies in the company. In that sense, role culture and power culture imply product differentiation strategy. Namely, in role culture 40 (55.6%) out of 72 respondents believe that their company won the competition using differentiation of their own products, and 32 (44.4%) of respondents believe that their company won the competition by leadership in costs. In power culture 77 (57.9%) out of 133 respondents believe that product differentiation strategy helped their company to win the competition in the previous period, while 56 (42.1%) opted for cost leadership strategy as a way to win the competition.

Table 3. Type of organizational culture * your company won competition in the market in the previous period

Type of strategy			Type of organizational culture				Total
			Role culture	Power culture	Task culture	Support culture	
Your company won competition in the market in the previous period:	by leadership in costs	Total	32	56	2	5	118
		%	44.4%	42.1%	24.0%	33.3%	36.4%
	by differentiation of its own products	Total	40	77	79	10	206
		%	55.6%	57.9%	76.0%	66.7%	63.6%
	Total	Total	72	133	104	15	324
		%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests			
	value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.806	33	0.013
Likelihood Ratio	11.173	33	0.011
Linear-by-Linear Association	7.364	11	0.007
N of Valid Cases	324		

Source: Author's analysis

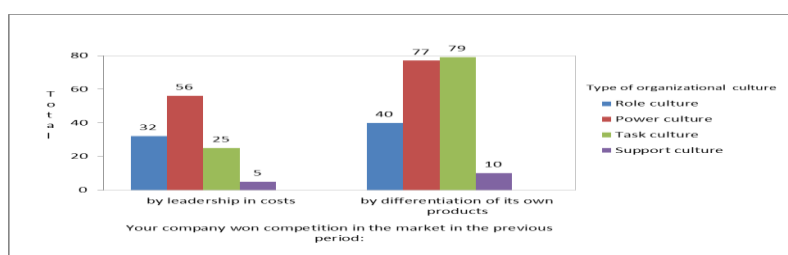


Figure 3: The company won competition in the market in the previous period

4.3. Discussion of research findings

The hypothesis that *organizational culture determines business strategy* is confirmed only partially. Therefore, in the part that relates to company's orientation to one or more market segments when choosing a business strategy, it was found that there is no statistically significant connection between the type of organizational culture and the strategy chosen, i.e. organizational culture does not affect the decision of the company to opt for one or more market segments when choosing the business strategy. Thus, the initial hypothesis that *organizational culture determines business strategy* in this area has not been confirmed yet.

In fact, despite the fact that the analysis encompassed companies that are relatively successful in their scope of activities, all companies in Montenegro are faced with the same or similar problems. These problems are actually the consequence of the crisis that caused macroeconomic instability, loss of the market, decline in market share, loss of competition (problems relevant to this study). In such a situation, it is understandable that companies will try to resolve these problems as soon as possible. On the other hand, the choice of strategy, as a business decision, depends on processes in the company (and those depend of in the company's environment). Market coverage represents the orientation of the company to a large enough market segment with a desire to strengthen the company in a given market and provide a competitive position. So, in order to consolidate the company in the market and ensure a competitive position (which is their primary target), regardless of the fact that the findings showed that organizational culture does not affect the choice of the company to opt for one or more market segments, the findings showed that the majority of respondents, when choosing a business strategy, opted for more market segments, i.e. 63% and 37% for one market segment.

The second part that refers to the way by which the company won the competition, the hypothesis is confirmed. Namely, the research has shown that there is statistically significant connection between

organizational culture and the way the company won the competition in the market. Our research has confirmed that the role culture and power culture imply a product differentiation strategy. It may be noted that the concentration of power leads to product differentiation strategy.

Role culture and power culture are both authoritarian cultures with uneven distribution of power, i.e. distribution of power concentrated at leaders (in power culture) and the top management of the company, i.e. technological profession (in role culture). This can be interpreted as a desire of the management to transfer its power to other segments outside the company (customers, suppliers and the like.) They will, through improvement of their products quality, try to build a powerful and recognizable brand in the market, which will, through power and advantage over the competition, provide affection and loyalty of customers. Besides, cost leadership strategy is quite risky. It is often said that it means "all or nothing". By choosing this strategy the company wants to gain an advantage on the basis of lower costs and sales prices. In that sense, companies that opt for this type of strategy have to withstand price war or not. In addition, there is the risk that the company loses its market, because it neglected development of product characteristics, then the risk of falling behind in technological development and the like. In our enterprises a dose of risk aversion is certainly present. The reasons can be found in current global economic crisis and increasingly caution about investing and also partly in national culture which, in the course of socialism was not exposed to risk (or the risk was minimal). Both role and power culture are bureaucratic cultures characterized by the resistance to risky combinations, inflexibility, resistance to changes and the like. So it is more realistic to expect that the companies in which power and role cultures dominate will avoid cost leadership strategy, thereby choosing product differentiation strategy, which, at this point, seems less risky which has also been shown by our research.

5. Conclusions and Recommendations

Theoretical elaboration of influence of organizational culture on business strategy as well as empirical research on Montenegrin companies' example shows that organizational culture and business strategy are mutually interacting categories, i.e. organizational culture influences the choice of appropriate strategic option. Depending on the degree of consistency of organizational culture with the strategy chosen, organizational culture can legitimize or delegitimize the strategy. In the case where culture legitimizes the strategy, the strategy is also easily applied. However, if culture delegitimizes the strategy the strategy chosen is impossible to apply. The strategy affects organizational culture by institutionalizing or deinstitutionalizing the same. If the chosen strategy is in accordance with the existing organizational culture, the strategy will further strengthen the existing organizational culture, i.e. institutionalize it. Likewise, long-term use of certain strategies will deinstitutionalize the existing organizational culture by which its process of change begins.

In order to achieve positive effects of organizational culture on overall operations of the company, it is of particular importance to harmonize the actual organizational culture of the company with the strategy chosen. The existing organizational culture creates the "limits of behavior" of the company that affect the degree of implementation of a business strategy. It presumes constant monitoring and review of the situation in order to affirm the choice of the strategy or to choose another adequate strategy. Therefore, recommendations for the management of the company would be the following:

- Management of the company must actively participate in the creation of such organizational culture that favors the company by whose implementation the effective implementation of business strategy will be ensured. This is the only way for successful operations of the company, i.e. ensuring a competitive advantage in the market;
- It is required to focus only on those segments in which the company acquired a certain level of trust of its consumers;
- The company needs to innovate the existing product range or create a new product for the segment in which he achieved the planned level of competitiveness;
- It is necessary to continuously analyze and review processes within the company, at the same time reviewing the existing strategies;
- A constant training of employees is necessary in order to achieve the level of understanding for processes that contribute to maintaining and increasing of competitiveness.

6. References

- Alvesson, M. 2002. *Understanding Organizational Culture*. London: Sage.
- Bouman, K. 2003. *Strategija u praksi*. Novi Sad: Prometej.
- Brown, A. 1998. *Organizational Culture*. Edinburgh: Person Education.
- Cameron, K.S., and Quinn, R.E. 2006. *Diagnosing and changing organizational culture: The competing vales framework (2th ed.)*. San Francisco: Jossey-Bass.
- Đuričin, D., Janošević, S. and Kaličanin, Đ. 2012. *Menadžment i strategija*. Beograd: Ekonomski fakultet.
- Handy, C. 1993. *Understanding Organizations (4th ed.)*. London: Sage.
- Handy, C. 1996. *Bogovi menadžmenta*. Beograd: Želnid.
- Harrison, R. 1972. Understanding your Organizations' Character. *Harvard Business Review*, 50(3), pp. 119-128.
- Hill, C.W. and Jones, G.R. 1989. *Strategic Management*. Boston: Honglition Mifflin.
- Janićijević, N. 1997. *Organizaciona kultura*. Novi Sad:Ulix.
- Janićijević, N. 2008. *Organizaciono ponašanje*. Beograd: Data Status.
- Janićijević, N. 2013. *Organizaciona kultura i menadžment*. Beograd: Ekonomski fakultet.
- Klein, A. 2011. Corporate culture: its value as a resource for competitive advantage. *Journal of Bussines Strategy*, 32(2), pp. 21-28.
- Kotter, J. and Heskett, J. 1992. *Corporate Culture and Performance*. New York: Free Press.
- Martin, J. 2002. *Organizational Culture: Mapping the Terrain*. London: Sage.
- Milisavljević, M. 1997. *Menadžment i strategije transformacije preduzeća*. Beograd: Ekonomski fakultet.
- Miller, A. and Dess, G. 1996. *Strategic Management*. New York: Mc Grow-Hill. Penguin Books.
- Porter, M. 1980. *Competitive Strategy*. New York: The Free Press.
- Robbins, S.P. 1993. *Organizational Behavior*. New Jersey: Prentice-Hill.
- Rokeach, M. 1973. *The nature of human values*. New York: Free Press.
- Saffold, S.S. 1988. Culture Traits, Strength, and Organizational Performance: Moving beyond "Strong" Culture. *The Academy of Management Review*, 19(4), pp. 699-727.
- Schein, E. 2004. *Organizational Culture and Leadership*. Thousand Oaks, CA: Sage.
- Schwartz, S.H. and Davis, S.M. 1981. Matching Corporate Culture and Business Strategy. *Organizational Dynamics*, 10(2), pp. 38-42.
- Todorović, J., Đuričin, D., and Janošević, S. 2000. *Strategijski menadžment*. Beograd: Institut za tržišna istraživanja.
- Žugaj, M. 2004. *Organizaciona kultura*. Varaždin: Tiva Tiskara.



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Consumption Habits During the Decision Making Process in Tourism

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It is crucial for all organizations that activate in this field to research and understand the way in which consumers make decisions and the factors that motivate and encourage tourists to make different purchases. Also, when analyzing a tourist's consumer behavior, companies must take into consideration: the needs and patterns of the consumers, consumer preferences and requirements, tourism market segmentation, and motivational factors such as cultural, personal, emotional, status, personal development, physical, etc. In this context, this paper aims to examine the responses of 154 tourists in relation to their predisposition to purchase and the patterns that are usually decisive in the decision making process regarding tourism services.

Keywords: consumer behavior, habit of purchase, buyer behavior, trips, customer satisfaction, tourists

JEL Classification: M31, M21

1. Introduction

The subject of consumer behavior in the tourism context is the key to the foundation of all marketing activities which are implemented in order to establish, advertise, and sell tourism products. The success of a marketing activity is primarily related to examine and understand consumers' decision making process to buy or use tourism services and products. Knowing their behavior patterns and the factors that influence their purchase, tourism companies could comprehend when they should get involved in the process in order to obtain the results they want to achieve. Also, in this way, organizations will be aware of how to influence their customers to buy different products that fulfill their expectations and needs.

Nevertheless, consumer behavior is a fascinating field, but rather difficult to research especially today in the hyper active and online environment. This statement is more relevant in tourism, where the buying decision has a strong emotional significance (Swarbrooke and Horner, 2007).

The decision making process in tourism is a complex and challenging process that has its deficiencies in explaining this type of consumer-related mechanism, because in order to make an analysis regarding purchasing in tourism, tourism enterprises have to take into consideration all the variables that influence a consumer, in different periods of time. This is very demanding due to the fact that tourists change their requirements frequently and their needs are unlimited. Thus, the way tourists choose their holiday should be continuously researched from many points of view, such as: motivators, factors that influence the decision making process, segmentation of the tourism market, the economic situation from different countries, patterns, habits of consumptions, etc., in order to better comprehend the purchase behavior of tourists. This particular

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research could be difficult and time consuming for all the tourism companies, but in this period of time, where the competition is more and more aggressive, this is the only solution that can guarantee the success that any enterprise is eager to achieve.

2. The Concept and Dimensions of Consumer Behavior

Consumer behavior has changed dramatically in the last decade. Currently, consumers can benefit from full custom options, in particularly in tourism services because a consumer can choose his ideal vacation, planned to the last detail, through internet.

The phrase "consumer behavior" is defined by the behavior that consumers display in the research, acquisition, use, evaluation, and disposition of certain products and services from which they expect to fulfill all their expectations and needs. Consumer behavior focuses especially on how individuals take decisions to spend their available resources of time, financial and effort, in order to satisfy all their desires. This includes what and how often they purchase, why they buy and when they buy, how often they use what they buy, how they evaluate after they purchase, and the impact of these evaluations on future purchases (Schiffman and Kanuk, 2009).

Consumer behavior is defined by those actions of individuals involved directly in the production and use of goods and services, including the decision making process that anticipates and determines these acts (Engel and Blackwell, 1986).

During the period of development, the field of consumer behavior has been known as buyer behavior, which reflects with intensity the interaction between consumers and producers at the time of purchase. Many marketers recognize today, the fact that this area is an ongoing process: it does not matter just what happens when the consumer buys a service or product for a sum of money, it also matters what happens before making the decision to purchase and after the acquisition.

Therefore, we must take into consideration different problems from the point of view of consumers, but also the marketers, which occur during the acquisition process, as well as before and after consumption of the product or service. These issues are presented in Table 1.

Table 1. Problems that appear during the acquisition process

	From the consumer perspective	From the marketer perspective
Problems that occur before consumption	<ul style="list-style-type: none"> - How does the consumer decide if he needs a particular product or service? - What are the best sources of information by which the consumer can procure all alternative data about others consumption alternative? 	<ul style="list-style-type: none"> - What is the consumer's attitude towards the product and / or the modified one? - What are the indices that causes the consumer to presume what products are superior to others?
Problems that occur during the acquisition process	<ul style="list-style-type: none"> - Is buying a product stressful or pleasant experience? What does this process say about the consumer? 	<ul style="list-style-type: none"> - How do factors such as time and retail store influence the buyer's decision to purchase?
Problems that occur after consumption	<ul style="list-style-type: none"> - Does the chosen product offer the pleasure and performance predetermined? - How is the product disposed of? And which are the consequences of its removal on the environment? 	<ul style="list-style-type: none"> - What determines whether a consumer will be satisfied with the product and whether he will purchase it again? - Will the consumer tell others about his experience with that product and influence their purchase decision?

Source: Solomon M., "Consumer Behavior: Buying, Having and Being", 2004, p.112

3. Research Premises

3.1. Research Context

One of the most important contributions of the marketing research is to define the decision problem that requires providing solutions. Thus, the decision problem identified on the conducted research help us to know in detail some habits of consumption and patterns that interfere in the decision making process in tourism, as a result of all the changes which appear in the social and economic environment, at a global level.

Based on the identified decisional problem, the purpose of the research is determined, which allows the solving of the decisional problem.

Thus, the purpose involves determining consumer preferences and their buying intentions regarding tourism services (Carver and Nash, 2009). The next step in the preliminary stage of the marketing research process is setting the objectives. The established objectives are derived from the purpose of the research. They consist in specifying at an operational level all information needed for choosing the optimal decision for each dimension of the investigated problem. Generally, to analyze consumer behavior in tourism I determined the following hypotheses:

Hypothesis 1:

Usually, tourists who arrange their trips with their family choose as mean of accommodation luxury hotels (4-5 stars) or mid-level hotel (3-4 stars).

Hypothesis 2:

In general, tourists' expectations were completely satisfied when they spend over 2000 euro on their trips.

Hypothesis 3:

Ordinarily, tourists, whose expectations were partially satisfied, spend their holiday in a camping or hostel.

Hypothesis 4:

In most cases, tourists who travel alone, spend on their trips less than 500 euros.

The research instrument for this research implied four questions that are defined conceptually and operationally in Table 2.

Table 2. Conceptual and operational definition of variables used in research

Name of the variable	Conceptual Defining	Operational Defining
Habit of travel	Ways of traveling that have acquired consistency in terms of acquisition of tourism services.	<ul style="list-style-type: none"> • Trips with family • Trips with friends • Couple trips • Traveling alone
Habit of acquisition	Consumers' consistency regarding the budget allocated to the acquisition of a trip	<ul style="list-style-type: none"> • < 500 euro • 500-1000 euro • 1500- 2000 euro • >2000 euro
Satisfaction	Consumers' expectations regarding the quality of tourism services.	<ul style="list-style-type: none"> • The expectations were completely satisfied • The expectations were highly satisfied • The expectations were partially satisfied • The expenses did not meet all the expectations

3.2. Design Phase of the Research

The design phase involves all activities of the researcher to identify the sources of information necessary, the means used in gathering information, systematization of the information, establishment of the budget and time scheduling of the research.

For this research, choosing the right information sources, was based on the identified objectives in the previous phase and are presented in the following table, based on some basic criteria:

Table 3. Typology of information sources used in the research

Criteria	Types of sources	Explications
The origin of the source in relation to the organization requesting the information	External sources	In this research, I will follow all the responses of consumers and final users of tourism products and services offered by different organizations.
The type of information provided by the source	Primary information sources	This type of information source relates to those obtained for the realization of the objectives of the research, and they are obtained from the population. The aim is to seek information from national consumers, namely from Romania.
The identity of the source	Individual	The individual is the basis of the research to obtain data regarding the purchase behavior of some products such as tourism services, but also detecting the dimensions that lead to the decision of acquisition.

In this research, I used dependent variables (information that involves knowing the socio-economic and demographic profile of respondents) and independent variables (e.g., intention to purchase or repurchase, buying habit of holidays, etc.).

The measurement of each variable was realized using a particular scale chosen depending on the nature of the studied (Table 2), and objectives of the research.

For data collection, I used as a method of gathering information, the primary and direct research. In this case the information was collected directly from their carriers using the internet, from January 4 to March 14, 2014.

The research was a selective one and it was conducted on a sample of 154 people. The method of research used was the survey. The survey is defined as a primary data collection method, based on a questionnaire administered to a representative sample of respondents (Cătoi, 2002).

The data collection phase for this research was conducted via the Internet. The questionnaire was created on the website the forms section of GoogleDocs and its associated link was posted repeatedly on networking sites like Facebook and Twitter, where I have targeted groups with tourism as the common interest. In this way, systematic information was obtained, processed and analyzed from 154 respondents, from 4 January to 14 March 2014. Table 4 present the profile of respondents for this research.

Table 4. Respondents' profile

Sex	Age	Status	Frequency	Percentage (%)	Cumulative Percentage (%)
Male	< 20 years	Pupils	2	100.0	100.0
		Students	10	37.0	37.0
	Between 20-25 years	Employee full-time	11	40.7	77.8
		Employee part-time	1	3.7	81.5
		Free independent	4	14.8	96.3
		Unemployed	1	3.7	100.0
		Total	27	100.0	
	Between 25-30 years	Employee full-time	9	100.0	100.0
	Between 30-35 years	Employee part-time	4	66.7	66.7
		Free independent	2	33.3	100.0
		Total	6	100.0	
	Over 40 years	Employee full-time	1	100.0	100.0
	Total male respondents		45	29.2	
Female	< 20 years	Pupils	4	100.0	100.0
	Between 20-25 years	Students	63	69.2	69.2
		Employee full-time	23	25.3	94.5
		Employee part-time	2	2.2	96.7
		Free independent	3	3.3	100.0
		Total	91	100.0	
	Between 25-30 years	Students	1	12.5	12.5
		Employee full-time	6	75.0	87.5
		Free independent	1	12.5	100.0
		Total	8	100.0	
	Between 30-35 years	Employee full-time	3	60.0	60.0
		Free independent	1	20.0	80.0
		Unemployed	1	20.0	100.0
		Total	5	100.0	
	Over 40 years	Full-time employee	1	100.0	100.0
	Total female respondents		109	70.8	

4. Empirical Analysis and Results

After establishing the premises of the research, we proceeded with data analysis in the form of a descriptive Crosstabs analysis for categorical variables. Table 5 presents the results of the statistical analysis which takes the form of a contingency table for categorical variables, with a summary and interrelations between two variables. In this case, we considered the question that was studying the preference for a particular season and the habit of purchasing a holiday package.

According to the first Crosstabs analysis, based on the question: "Generally, how often do you go on holidays during one month?" and "Usually, I prefer to go on vacations....", *the first category* will contain all the tourists that never go on holidays, although, one respondent mentioned that occasionally, when he has some free time, he chooses short trips. *The next category* will include consumers who go on trips at least once a year, especially during summer (23.4%). *The third classification* recorded an 8.4 percent of tourists who organize their vacations at least two times per year, whenever they have a few days off. *The last category* includes a percentage of 2.6% (respectively 4 tourists) traveling more than 4 times per year, whenever they have some free time or during summer.

Table 5. Distribution of tourists by frequency and choice of period of holiday

			Usually, you prefer to set your holidays:				Total
			On both seasons	Whenever I have some free time	During winter	During summer	
Generally, how often do you go on holidays during one month?	Never	Frequency	0	1	0	0	1
		% Of Total	0.0%	.6%	0.0%	0.0%	.6%
	Once	Frequency	12	11	2	36	61
		% Of Total	7.8%	7.1%	1.3%	23.4%	39.6%
	Twice	Frequency	25	7	0	30	62
		% Of Total	16.2%	4.5%	0.0%	19.5%	40.3%
	Three times	Frequency	7	13	0	6	26
		% Of Total	4.5%	8.4%	0.0%	3.9%	16.9%
	Four times or more	Frequency	0	1	0	3	4
		% Of Total	0.0%	.6%	0.0%	1.9%	2.6%
Total		Frequency	44	33	2	75	154
		% Of Total	28.6%	21.4%	1.3%	48.7%	100.0%

The second descriptive analysis (crosstabs), applied to categorical variables, aimed at achieving a distribution of responses of tourists to observe the consumer satisfaction regarding the trips they arranged so far compared to the amount of money they are willing to spend on a holiday. The results of the analysis are shown in Table 6.

The first category of responses includes all the tourists who spend on vacations sums of under 500 euros, and overall have had experiences that have risen to their expectations (43.1%).

The second category of responses contains a percentage of 23.5% (Table 3) or 36 tourists who spend between 500-1000 euros per trip, and they are generally satisfied with the tourism services acquired so far, given their disposable income.

The third category includes nine tourists who were willing to pay from 1500 to 2000 euros on different tourism services, being mostly satisfied by these acquisitions.

The last category of tourists is composed of two categories of tourists: people who consider the quality of the trips they had so far in accordance with their expectations, and the other category includes those people whose trips have mostly satisfied their expectations; both divisions were reaching a point of 2000 euro for a specific holiday.

Table 6. *Distribution of tourists based on the expenses made on the organized holidays and satisfying their expectations*

			What was, in general, the quality of the trips that we have taken so far, according to your expectations?				Total
			The expectations were completely satisfied	The expectations were highly satisfied	The expectations were partially satisfied	The expenses did not meet all the expectations	
How much do you usually spend on a holiday?	< 500 euro	Frequency	6	66	18	0	90
		% Of Total	3.9%	43.1%	11.8%	0.0%	58.8%
	500-1000 euro	Frequency	7	36	1	0	44
		% Of Total	4.6%	23.5%	.7%	0.0%	28.8%
	1500-2000 euro	Frequency	4	9	1	1	15
		% Of Total	2.6%	5.9%	.7%	.7%	9.8%
> 2000 euro	Frequency	2	2	0	0	4	
	% din Total	1.3%	1.3%	0.0%	0.0%	2.6%	
Total		Count	19	113	20	1	153
		% din Total	12.4%	73.9%	13.1%	.7%	100.0%

5. Conclusions

Like any other complex process, the process of acquisition in tourism has its weaknesses in explaining this type of mechanism linked to the consumer, because, in order to make an analysis based on tourism purchases, the companies which work in this field should be aware of all factors that influence the consumer at different periods of time and different stages of the buying funnel. This is particularly complicated because tourists often change their requirements and their needs very often and their prospect offerings seem to be endless in today's business environment.

Therefore, the way how tourists choose their types of holidays should be investigated continuously in order to better understand the behavior of tourists and offer them those products and services that reflect their needs, desires and predispositions. Consumer behavior should be studied in terms of its many patterns during the purchase process, because it depends on different factors that can appear during an acquisition (for example: the type of holiday to be taken, their motives and the determinants of that particular purchase, their lifestyle, their social position).

Another impediment regarding the tourism products and services is the intangibility of these offers, which often leads to doubts and uncertain decisions during a purchase. This is why individuals may take advices from friends, relatives, travel agents and television which could determine certain underlying problems for companies when they are studying tourist behavior patterns. Withal, the acquisition of the holiday is an important event in a person's life because the trip could represent the escape from the monotony of his life, his work and could become the chance to relax, have fun, and enjoy a few days away from home.

Peter Drucker said that "the main purpose of a business is to create customers." And to create customers, should be considered the idea that consumers base their purchasing decisions on the perceived value of product performance overall to meet their needs and necessities, and the marketing process is based on the exchange that takes place between the organization and consumer. For that transaction to take place, both sides must reach an agreement on the exchange, which will take the form of the marketing offer transaction marketing proposed by the organization.

Also, future research should draw attention to the process of making the right decisions in this particular area and to understand how consumers respond to different variables. Moreover, it is important to research all the factors that influence a tourist to return to the same tourism destinations, the season preferred to arrange vacations, the principal motives for travel or the most significant sources of information used while arranging trips.

6. References

- Carver R., Nash J. (2009). *Doing data analysis with SPSS v.20*. Boston: Cengage Learning.
- Cătoi I. (2002) *Cercetări de marketing*, Uranus, București.
- J.F. Engel, R.D. Blackwell, D.T. Miniard (1986). *Consumer Behaviour - Ed. 5-a*, The Dryden Press, 1986.
- Kotler, P., Kevin, L.K. (2014). *Marketing Management*. 14th edition, N.J.: Prentice Hall.
- Schiffman L., Lazar Kanuk L. (2009). *Consumer Behavior – 9th Edition*, Pearson Prentice Hall Publishing, New Jersey, 2009.
- Solomon M. (2004), *Consumer Behavior: Buying, Having and Being*, Pearson Prentice Hall.
- Swarbrooke, J., Horner, S. (2007). *Consumer Behaviour in Tourism – 2nd Edition*, Oxford: Butterworth Heinemann.



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Coherent Division of Labor in a Three-Dimensional CAD New Product Development Environment

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This experimental field study examines the influence of a variable ratio between engineers and technical draftspeople in New Product Development (NewPD) Teams in a three-dimensional CAD construction environment on economic and socio-psychological efficiency. With the implementation of the 3D CAD software (Three Dimensional Computer Aided Design) the world of engineers seemed to become a completely new and fascinating one in which the engineer is a 100% creative part in the NewPD process of an innovative company – with all supporting activities taken over by marvellous software, automatically and completely. Technical draftspeople who did supporting activities so far declined rapidly. The literature review shows the improvements by 3D CAD, the areas where the SW is over-challenged and a discussion of division of labor in detail. The Causal Model for socio economic analysis shows possible cause-effect relations between different team constellations in NewPD teams under 3D CAD conditions.

Keywords: New PD, economic/socio-psychological efficiency, new product development, division of labor

JEL Classification: M54 - Labor Management

1. Introduction – Division of Labor / 3D CAD – Fascination and Demystification

With the implementation of 3D CAD the world of engineers seemed to become a completely new and fascinating one in which the engineer is a 100% creative part of an innovative company – with all supporting activities taken over by marvellous software, automatically and completely. The intention of this paper is to demonstrate how the day-to-day-life of engineers in medium-sized companies actually has changed and to claim for a rethinking of the really achievable improvements by 3D CAD and where the SW is over-challenged. Based on this reassessment of the strengths and weaknesses / the pros and cons of 3D CAD this paper will try to develop an approach of how to find an adequate team structure by analysing the various kinds of tasks to be fulfilled by an engineer within a development department of a medium-sized company with respect to the level of qualification required. And following this, the paper will try to define the prerequisites for a coherent division of work which should finally increase the economic and the socio-psychological efficiency of the development department and of the company as a whole, measured in terms of time, cost, quality, job satisfaction and the methodical responsibility of the engineer.

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2. Literature Research – Theoretical and Empirical Evidence

2.1. The Starting Point: Organisational Basics vs. “Modern” Engineering

It is commonly agreed in theory as well as in practice that speed is the key point for success in commercial competition (cf. Scheer, 2003; Hirzel et al., 1992) and that the development departments are one of the greatest bottlenecks in the turbulent, fast-moving business environment (Ehrlenspiel, 2007). There is actual a basket of methods available to overcome the pressure on engineers in development departments, e. g. project management, process oriented approaches, standardization or division of labor. According to these ideas companies have worldwide established their procedures since decades, some up to more than 100 years, until a “revolution” has dramatically changed at least the organization of mechanical development departments in medium-sized companies, the 3D Computer-Aided Design. With 3D CAD the engineers in these companies have more or less lost their “right-hands”, the technical draftspeople and the massive drawing documentation work was creeping towards the engineer. This over-reaction was initiated by the fulsome praise of the software companies, was unconsciously fostered by the universities and was put in operation by the medium-sized companies - in expectation of substantial reductions of lead time and cost. But one tricky outcome of the 3D CAD revolution was that even with the new design system the possibility to “produce” more variants and the customer demand for more variations increased essentially, with a rather negative impact on the workload of the engineers. In that context Wildemann (2003, p.7) found that from 1980 till 1997 the number of variations in the receipt of orders inclined within growing markets by 410% whereas the number of orders increased only by 240% and this trend continued unbroken and even more extensive in stagnating markets. Recent analysis of the workload of engineers under 3D CAD-conditions revealed – unsurprisingly – that at least one third of the hours of work is related to supporting activities, to distributable work (Wittenstein, 2007, p. 189). The development engineer has to fulfil several tasks at the same time: he works for the sales, supports the manufacture, the assembly or the work preparation in the case of problems with new products, is responsible for the order of tools plus machines and generates nearly the whole product documentation (Ehrlenspiel, 2007, p. 277 sqq.). The organization of his daily work, correspondence and travel management has to be done on the side. Interruptions and unforeseen tasks are characteristic for his daily routine. Time for the actual product developments is drastically restricted, especially in medium-sized companies. Owing to the above described developing engineer’s multi-functionality, in practice proven concepts which offer with given resources the best possible solution are often preferred (Ehrlenspiel, 2007). These exploitation processes with their unsound fixation to existing solutions is one big hurdle for innovation (Kliesch-Eberl and Eberl, 2009) and according to BMBF (2007, 2011) the capability to innovation of small and medium-sized companies is especially strong related to the availability of sufficient qualified and experienced members of staff. There is obviously a strong need to apply proven organizational basics in order to utilize valuable resources adequately.

2.2. 3D CAD: A very powerful SW - but no Jack-of-all-trades

The features and benefits of 3D CAD as described e.g. by the (PTC - Parametric Technology Corporation, 2013) are:

- Superior product differentiation and manufacturability by powerful parametric design capabilities
- Fully integrated applications allow to use a single application for the entire development cycle - from concept to production
- Automatic onward transfer of design changes to all downstream delivery components for increased confidence in the construction work
- Comprehensive functions allow for virtual simulation improved product performance and an even higher product quality
- Automated generation of associative tooling design and manufacturing deliverables.

This is according to (Solid Edge/Siemens, 2000) to be understood in combination with a remarkable cost saving potential, e.g. productivity jump in the ratio of 4:1 (= personnel cost minus 75%), minimized alteration service due to reduced error rate by 90%, reduced tooling costs by more accurate and more complete information, less waste, less inspection effort, fewer test runs in development. This is not the place to analyze all these benefits of a really mighty SW; they are actually realized also in medium-sized companies to a certain extent. However, what is most critical for the daily practice in these companies was the “promise” of full integration from concept to production and the remarkable personnel cost saving potential which was obviously taken as the signal to change the team structure of mechanical development departments dramatically by reducing the commitment of technical draftspeople. Furthermore the components which are to be constructed have become much more complex (DFA-extensive functional integration, deterministic finite

automation), and free-form surfaces, which had not been possible so simply before 3D CAD were invented, led to a higher level of complexity – amongst others - within the drawing up of technical drawings. As a matter of fact the 3D CAD software is not such efficient to work them out automatically and it is the engineer in medium-sized companies who creates the drawings usually in these days. In an empirical study (Kessler and Chakrabarti, 1999), found that clear time-goals, longer tenure among team members, and parallel development all could increase speed, whereas design for manufacturability, frequent product testing, and computer-aided design (CAD) systems decreased speed. Moreover, they also found that some factors speed up radical innovation (e.g., concept clarity) and slow down incremental innovation. Actually for this study it is important to mention that there is already empirical evidence that CAD decreases speed in new product development. This is completely contrary to the promises of the 3D software companies. As already explained, it is not at all the intention of this paper to query the investment decision for the implementation of 3D CAD in development departments of medium-sized companies, for that 3D CAD is really a strong tool, but the paper intends to demonstrate that these companies have good chances to increase their efficiency considerably by using it adequately and - by going back to the application of the basic ideas for efficient organization, to a coherent division of labor.

2.3. Coherent Division of Labor

Convinced of a solvable imbalance in respect of the allocation of personal resources, the next step must be, to examine the discussion on division of labor in detail. Since the beginning of the industrial revolution at the end of the 19th century up to the 60s of the 20th century the concept of Taylorism, the scientific management was the dominant system for the organization of operating procedures in order to achieve maximum productivity (cf. Taylor, 1911; Heinen, 1974, p. 449). The headstone was already laid down more than 100 years before by Adam Smith with his proposal to increase productivity by specialization via a process of deepening division of labor extensively (Smith, 1776). According to these ideas productivity will increase by reduced work training, learning effects, higher speed of completing one's task, better assignment of responsibilities and possible faults, reduced burden and less labor cost (Kieser and Walgenbach, 2003, p. 81). While A. Smith concentrated his researches on macro-economic aspects of the division of labor, F. W. Taylor studied the micro-economic ones. F. W. Taylor's merits can be seen in the relieve of work operations from their deficits laying in the workers, the tools and the materials by a systematic and methodical analysis and by assembling the results, deactivating all random events (Gutenberg, 1966, p. 144-146). For this paper especially the arguments of achieving more speed and lower cost etc. by a systematic and methodical analysis will be followed up later. But this completely mechanical point of Taylor's view - had to make way for the social welfare and human relation movement (Heinen, 1974, p. 451f) for various reasons e.g. the workman is condemned to monotonous routine and thinking, initiative, work satisfaction and joy are denied and individuality and innovative spirit are being destroyed. Insights about the disadvantages of a too extensive division of labor are described many times (cf. Kieser and Walgenbach, 2003, p. 81 sq.; Ehrlenspiel, 2007, p. 184 sqq.). According to these insights and accompanied by an overall change in values and even individualization, science of work has turned to the aim of arranging for human working surroundings since the 70s of the 20th century. Re-integration is one of the basic attempts of previous eliminated labor contents to design integrative tasks with the aim of disposal of negative effects of the division of labor and to increase the motivation of members of staff by job enrichment, use of different abilities, social interaction, areas of independent decisions and personal development (cf. Kieser and Walgenbach, 2003, p. 82 sqq.; Ulich, 2001). But even task integration as well as specialization is limited: „Important is to have a task and job based specialization” (Weltz and Bollinger, 1987, p. 52 sqq.). Kühn et al. (2006, p. 154) noted a rising integration of tasks by specialized experts, of tasks, which could easily been done by people with a lower level of expertise. Therefore Mayer (1988) demands a cooperative division of labor with a specialized expert in the center. There are no definite determinations concerning way and level of division of labor in the development of products. Different kinds of division of labor can simultaneously be seen within only one company or even only one project. The concrete distinctness is dependent on the level of the complexity of a project as well as of the size of the company. Within product development a task can in principle be divided sequentially - in different single steps, worked on one after the other - or parallel - divided according to quantities or objects - (Ehrlenspiel, 2007, p. 163 sqq.). In addition a horizontal division – in tasks equal in ranking – and a vertical division - in optional and performing tasks or in, what is subject to this paper, creative and routine activities – must be under consideration (Scholz, 1995). Hubka (1976, p. 14) distinguishes among five different kinds of development / construction tasks:

- Skilled labor in terms of technical and scientific considerations to think ahead of a mechanical system.

- Activities associated with the description of the mechanical systems.
- Skilled labor, but no direct contribution to the design of mechanical systems.
- Supporting work, e.g. copy, cut and archive of drawings.
- Management activities.

Based on this structure (Mayer, 1988, p. 80 sqq.) raises the question how the coordination between experts and supporting members of staff must be designed. Vertical task integration proves itself so long as coherent as it does not lead to uneconomic use of (high) qualification. Wittenstein (2007, p. 98) substantiate this demand with what she is calling “Sinnvoll verteilbare Arbeitseinheit – SVAE - practically distributable work unit”. One of the essential influencing variables for a practicable distribution, one of the k.o.-criteria, is the ratio of effort of time for distribution vs. temporal scope of effort; the smaller the ratio is, the better is the suitability for distribution (Wittenstein, 2007, p. 136). It is subject to this paper to outline a verifiable procedure to determine a coherent package of tasks to discharge the development engineer in development departments of medium-sized companies, to establish a motivating, autonomous work package for a draftsman in modern design under 3D CAD-conditions and to increase the efficiency of the development departments – without losing flexibility in highly competitive markets.

3. Research - Premises, Methodology and Analysis

3.1. Establishing a coherent, dynamic Team Structure

The research design of this paper is constructed with the intention to work out whether the employment of technical draftspeople in mechanical development departments of medium-sized companies for the setting up of drawings (product documentation) will increase the economic and the socio-psychological efficiency i.e. whether an optimal team structure can be established under 3D CAD construction conditions. The methodology is to perform projects in the real industrial environment with different team configurations in an experimental field study. Basic requirement is to define a comparable 3D CAD standardized project. A comparison of time, costs, quality of the drawing set, human resource development and job satisfaction will be made between division of tasks (with draftspeople) and multi-function (engineers alone) - with different personal commitments and in quantities qualified for statistical analysis. To do this the standardized project has to be specified to standardized engineering drawings without further capacity burden. As development activities can be distinguished through the level of novelty of the task into: innovations, adjustment constructions and variant constructions (cf. Ehrlenspiel, 2007, p. 256 sqq.) a representative kind of development activity in mechanical development departments of medium-sized companies is to be selected. A construction is called innovation if all phases of the construction process are gone through and if a new product with on principle new solution comes into being. In an adjustment construction the concept exists and the draft is adapted according to changed demands. Variant construction means that the draft is at least given roughly-qualified and essentially, measurements have been changed due to the customer's performance or rather interface demands. Researches have shown that the highest percentage of time is being filled with variant constructions and partly also with adjustment constructions. Innovation constructions make up only 10% of the development tasks (Ehrlenspiel, 2007). This paper intends to define and to analyze one of the three typical performance variants in technical departments. To have a high external validity that type of project is selected, because of its worldwide major dissemination. The paper will demonstrate that the statement “there is no detailed argumentation required to prove the effect of increasing productivity/efficiency by division of labor” made about 45 years ago by (Gutenberg, 1966, p. 144) is still valid under 3D CAD conditions in mechanical development departments of medium-sized companies and therefore it is even today possible and necessary to define an optimal team structure – also in that specific environment. Cohen et al. (2000) analyzed several new product performance metrics. The analysis showed the dilemma between ambitious time to market, product performance and development costs. An overly ambitious time-to-market target leads to an upward bias in resource intensity usage and a downward bias in product performance (i.e., evolutionary product innovation). Given a target product performance, the analysis show that the coordination between marketing and R&D is easier because the resulting development resource intensity and time-to-market decisions becomes separable. However, an overly ambitious product performance target leads to an upward bias in the development resource intensity and a delayed product launch that misses the window of opportunity. Finally, the analysis show that the target development cost approach can lead to a downward bias in product performance and a premature product launch. In the case of this paper there are good chances to increase all of the three commonly used new product performance metrics: (1) time-to-market, (2) product performance and (3) total development costs

by finding a coherent ration between engineers and drafters in a 3D CAD construction environment. The selective manipulation of that ratio should lead to differences in the three metrics plus differences in employee's competences and job satisfaction.

3.2. Causal Model

Basic Hypothesis: The employment of technical draftspeople for the setting up of technical drawings (product documentation), increases the economic and the socio-psychological efficiency of mechanical development departments in medium-sized companies.

According to figure 1 defined standard projects are to be executed at various levels of selected independent variables. The standard projects belong to variant construction, the most frequent development project identified in general (cf. Ehrlenspiel, 2007, p.256 sqq.). Previous research suggests that project complexity can have significant influence on a team performance (Ancona and Caldwell, 1992) and speed to market / lead time (Kessler and Chakrabarti, 1999). Therefore a standard project as already mentioned is defined to have evidence that the manipulation of the independent variables leads to changes in the dependent one's. Every development project is divided into three phases, the preparation phase, creative phase and executing phase. In the first two phases engineers have to be always present. In the third one there is also extensive repetition work to do and in this phase division of labor is possible between engineers and technical draftspeople depending on the task. This third phase is the starting point for measuring the lead time of the defined standard project and the center piece of the presented model. The time required for phase 1 and 2 depend from a lot of factors outside the engineer's range of influence and so the spread of lead time should be drastically reduced. The selective manipulation of the independent variables should lead to visible changes of lead time. The intention of this scientific project is to generate substantial cause-effect relationships for the above mentioned conjecture, the basic-hypothesis, with due regard to the scientific quality criteria as validity, reliability and representativity – knowing from Buckler (2001, p. 17), that a final proof of causality is not really possible. The method used is a causal analysis, the established method for the analysis of various social and economic issues. The causal analysis is - in general - a confirmative procedure to validate a complex set of hypothesis in respect of the dependence structure between research variables by empirical collected data. Causal analytic models are mathematical constructs which shape proposed cause-effect relations and try to prove them by statistical procedures, as co-variation- correlation- and regression analyses (Neuert, 2009, p. 134 sqq.). According to Buckler (2001, p.31) a causal model is basically composed of an independent structural variable (X) which has effect on the dependent structural- to be explained variables (Y, Z), i.e. - in the simplest case - $Y/Z = f(X)$. The independent structural variable (X) itself is explained by a set of exogenous latent variables whose values are determined by factors outside the model (measured by $x_1 - x_n$) and in this connection X is a dependent variable. The dependent - structural variables Y and Z are determined by factors within the model i.e. by X and measured by latent endogenous variables $y_1 - y_n$ and $z_1 - z_n$. Transferring this understanding to the object of that study we receive the following explanatory model:

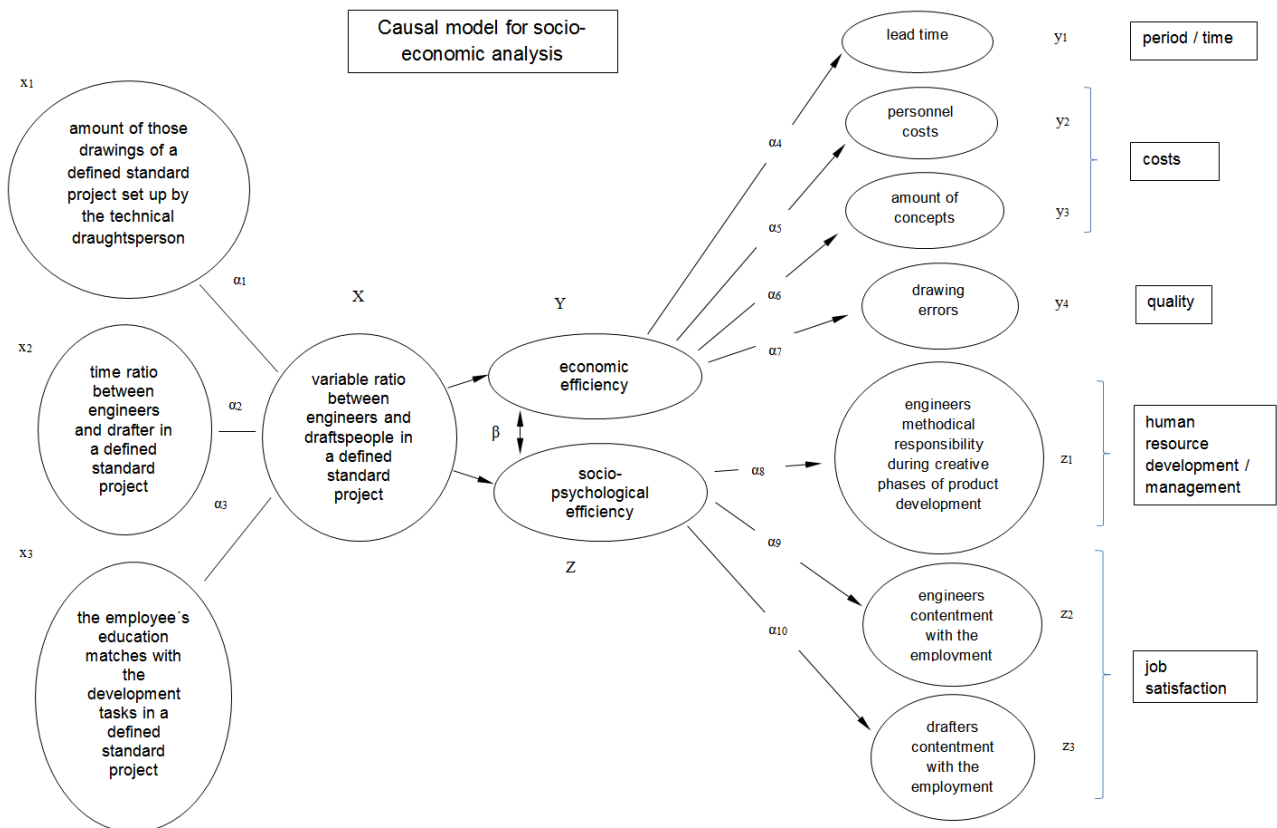


Figure 1. Explanatory model
 Source: Author

Legend for the causal model:

- X = independent structural variable
- $x_1 \dots x_3$ = latent exogenous variables (measurement variables)
- Y, Z = dependent structural variables
- $y_1 \dots y_4$ = latent endogenous variables (measurement variables)
- $z_1 \dots z_3$ = latent endogenous variables (measurement variables)
- $\alpha_1 \dots \alpha_{10}$ = correl. degrees of dependence between structural & measurement variables
- β = correlative degree of dependence between dependent structural variables

The model demonstrates the system of exogenous latent variables $x_1 - x_3$, the structural independent variable X, the structural dependent variables Y and Z and the set of observed endogenous latent variables $y_1 - y_4$ and $z_1 - z_3$ (for the measurement of achieved impacts on Y and Z by various degrees of X). The preparation of the characteristics of the cause-effect relations between the variables ($\alpha_1 - \alpha_{10}$ and β) is an essential part of this verification procedure. The action parameters (exogenous latent variables) to establish a set of manifestations of the independent structural variable X, the variable ratio between the employment of draftspeople and engineers, are: x_1 : the amount of drawings set up by drafter, x_2 : the time ratio engineer – drafter and x_3 : the education level of the team members matching with the task – in a defined standard project. These parameters/variables must be transferred into operational, measurable values in order to work out a statistical-quantitative analysis and at least a compound indicator for the independent variable as a whole. They will be modified following coherent limitations. The structural dependent variable Y, the economic efficiency, is measured by the endogenous latent variables y_1 : the lead time, y_2 : the personal cost, y_3 : the amount of concepts and y_4 : the number of drawing errors. Following the classical subject of microeconomics the variable Y must give information on cost, revenue, expenditures, benefit etc. This study will use a cost-benefit-calculation for an economic efficiency analysis to provide the option of combining hard and soft (socio-psychological) facts. y_1 , the lead time is a very strong measure. Time is the incorruptible, genuine dimension for a comparison of different procedures. All subjective, company-“political” impact is omitted. With variable y_2 the different hourly rates for engineers and draftpeople are taken into account. y_3 and y_4 give further indications for an adequate assessment of economic values. The structural dependent variable Z, the socio-psychological efficiency, is indicated by z_1 : the engineers’ methodical responsibility during creative phase of

product development z_2 : the engineers' contentment with the employment and z_3 : the drafters' contentment with the employment. As far as contentment with the job is concerned indicators received from satisfaction survey, absence and fluctuation must be considered. Based on the definition of main features of a standard project and the minimum requirements for work sharing between engineers and drafters the tests will be performed with a frequency required to get statistical relevant data. Subject of the iterations are the team structure (from for example 70% engineer: 30% drafter over 85:15 up to 100% engineers) and the number of drawings (about 200 drawings distributed from 100% engineer up to 100% drafter). The education level of the team members will be recorded for each of the individual iteration.

For validation of the model, i.e. verification respectively falsification, the statements in the form of hypotheses will be compared with results of the investigation, the real facts (Neuert, 2009, p. 136). By arranging stress tests the model must prove its reliability. If the real environment and the model match for selected parameters, we can draw the conclusions that the model reflects the aspects of reality sufficiently.

4. Discussion and Conclusion

With this paper one of the central elements of the causal model in discussion is addressed. Further components such as functional respectively competence diversity, modern PD methods and task satisfaction respectively cognitive dissonance must be considered accordingly in order to elaborate a solid theoretical and empirical basis necessary to supported the assumption of causality (Weiber & Mühlhaus, 2010, p. 13 sq.). After these additional comprehensive studies the scientific evaluation of the proposed causal relation between a coherent team structure and socio-economic efficiency in selected areas of NewPD within a 3D CAD environment can be performed and conclusions and suggestions inferred. A coherent solution for the imbalanced allocation of personal resources in NewPD is likely.

5. References

- Ancona, D.G. and Caldwell D. 1990. Beyond Boundary Spanning: Managing External Interdependence in Product Development Teams. *The Journal of High Technology Management Research* 1, pp. 119-138.
- BMBF. 2011. Bundesregierung setzt konsequent auf Bildung und Forschung. Pressemitteilung 095/2011. <http://www.bmbf.de/press/3121.php> (accessed 12 08, 2013).
- BMBF. 2007. Rede der Bundesministerin für Bildung und Forschung. http://www.bmbf.de/pubRD/mr_20070620.pdf (accessed 12 07, 2013).
- Buckler, F. 2001. *Neusrel: neuer Kausalanalyse Einsatz auf Basis Neuraler Netze als Instrument der Marketingforschung*. Göttingen: Cuvillier Verlag.
- Cohen, M.A., Eliashberg J. and Ho T.H. 2000. An Analysis of Several New Product Performance Metrics. *Manufacturing & Service Operations Management* 2, no. 4, pp. 337-349.
- Ehrenspiel, K. 2007. *Integrierte Produktentwicklung: Denkabläufe, Methodeneinsatz, Zusammenarbeit*. München/Wien: Hanser.
- Gutenberg, E. 1966. *Grundlagen der Betriebswirtschaftslehre. Erster Band: Die Produktion*. Berlin etc.: Springer.
- Heinen, E. 1974. *Industriebetriebslehre*. 3. Wiesbaden: Gabler.
- Hirzel, M. 1992. Mit Geschwindigkeit im dynamischen Markt reüssieren. *Speed-Management: Geschwindigkeit zum Wettbewerbsvorteil machen*, by Hirzel/Leder/Partner, pp. 19-26. Wiesbaden: Gabler, 1992.
- Hubka, V. *Theorie der Konstruktionsprozesse: Analyse der Konstruktionstätigkeit*. Berlin etc.: Springer, 1976.
- Kessler, E. and Chakrabarti A. K. 1999. Speeding up the pace of new product development. *Journal of Product Innovation Management* 16, pp. 231-247.
- Kieser, A. and Walgenbach P. 2003. *Organisation*. 4. Stuttgart: Schäffer-Poeschel.
- Kliesch-Eberl, M. and Eberl P. 2009. An extended perspective on innovation: Bridging organizational creativity to dynamic capabilities. *EGOS Colloquium, Barcelona*. Barcelona: EGOS Colloquium, 2009. 1-6.
- Kühn, F., Pleuger G. and Kreitel-Suciu A.. 2006. Ressourcenmanagement - Schlüsselkompetenz für ein erfolgreiches Projektportfolio. *Projektportfolio-Management: strategisches und operatives Multi-Projektmanagement in der Praxis*, edited by Matthias Hirzel, pp. 143-166. Wiesbaden: Gabler.
- Mayer, D. 1988. *Arbeits- und Organisationsgestaltung im technischen Büro*. Stuttgart: Univ. Diss..

- Neuert, J. O. 2009. Sozio-ökonomische Analyse der "Integrierten Mediation" als Konfliktregelungskonzept. Realtheorie, Modelkonstrukt und empirische Befunde, Wissenschaftliches Evaluationsgutachten. Kufstein: FH Kufstein.
- PTC 2013. Product Service Advantage. Multi-CAD-Umgebungen optimieren. <http://www.ptc.com/solutions/multi-cad-design/> (accessed 12 08, 2013).
- Scheer, A-W. 2003. *Real-Time Enterprise: mit beschleunigten Managementprozessen Zeit und Kosten sparen*. Berlin: Springer.
- Scholz, R. 1995. *Geschäftsprozessoptimierung: crossfunktionale Rationalisierung oder strukturelle Reorganisation*. 2. Bergisch Gladbach etc.: Eul.
- Smith, A. 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*. Reprint Chicago 1977: University of Chicago Press.
- SolidEdge/Siemens 2000. Umstieg von 2D nach 3D CAD, Vorteile durch Produktivitätssteigerung. http://solidedge.cad.de/download/dokumente/Von_2D_nach_3D.pdf (accessed 12 09, 2013).
- Taylor, F. W. 1911. *The principles of scientific management*. New York: Cosimo, 2006. London: Reprint of Harper & Brothers 1911.
- Ulich, E. 2001. *Arbeitspsychologie*. Zürich-Stuttgart: ETH und Schäffer-Poesche.
- Weltz, F. and Bollinger H. 1987. Dezentralisierung und Integration: Zauberformel der Büroarbeit. *Office Management*, pp. 52-56.
- Weiber, R. and Mühlhaus, D. 2010. *Strukturgleichungsmodellierung*. Berlin Heidelberg: Springer-Verlag.
- Wildemann, H. 2003. *Lean Management: Leitfaden zur Einführung schlanker Unternehmensstrukturen und Geschäftsprozesse*. München: TCW Transfer-Centrum GmbH.
- Wittenstein, A-M. 2007. Bedarfssynchrone Leistungsverfügbarkeit in der kundenspezifischen Produktentwicklung. *IPA-IAO Forschung und Praxis*. Heimsheim: Jost Jetter Verlag.



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Performance Improvement by Functional-Respectively Competence-Diversity in New Product Development

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This paper demonstrates the latest research results of the relationship between cross functional product development teams and project respectively team performance. The aim of this paper is to support the basic hypothesis of the author, which is "The higher the technical draughters' integration intensity in a 3D CAD (Computer Aided Design) product development project, the higher the economic and socio-psychological efficiency within that project", with the findings of recent research. Besides studying standard references, a systematic inquiry, using 2 scientific databases, Emerald and EBSCO was performed to study cross-functionality in New Product Development (NewPD). The increase of functional diversity in development teams which is supposed to promote performance is an inadequate variable. Essential to make a cross-functional team successful are competence diversity and familiarity. The intention is to apply competence diversity not only for companywide teams but also in single working units as in mechanical development departments of medium-sized companies.

Keywords: New Product Development, Functional-Diversity, Competence-Diversity

JEL Classification: M54 - Labor Management

1. Introduction - Research Question

The company which is faster in presenting convincing concepts determines the customer's mindset and has therefore a better chance to succeed in the current, intense competition. Against this background the ability to transfer new ideas to commercial products in a timely manner is an important competitive factor with high influence on the corporate success today (cf. Scheer, 2003; Hirzel, 1992). A survey concerning problems in research and development departments, held by Prof. Dr. Klaus Ehrenspiel, showed the following: the dominating problem of the development process where almost all employees, almost every company, almost all hierarchical positions and almost every line of business meet are project durations and deadlines (Ehrenspiel, 1995, p. 149). In departments concerned with the development of products, reaction time, processing time, lead time and innovation performance are on the one hand affected by the availability of qualified members of staff. On the other hand members of staff within the development departments are comparatively expensive. The high percentage of qualified employees - more than half of them (55%) are academic personnel, around 20% are technician (BMBF, 2004, p. 178 sq.) - implies high personnel costs for a company. Owing to a enormous deficit of qualified employees, which is already now lamented and which will

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probably even increase (cf. Wittenstein, 2006, p. 66; BMBF, 2004, pp. 479 sqq.), personnel costs for this group of employees are likely to incline in the following years. That is why the appropriate number of qualified personnel will become even more and more expensive, but in the meantime it is one of the most crucial basic conditions of the ability to innovation (Kliesch-Eberl and Eberl, 2009). In the face of the importance of high costs for competitiveness and innovativeness, new ways of thinking have to be considered. One approach towards an economical and socio-psychological efficient development process in a 3D CAD NewPD engineering environment could be the consistent assignment of technical draughts people in mechanical development departments in medium-sized companies who would relieve the development engineer from all part and assembly orientated documentation. Also, according to the BMBF (2011), there is the ability to innovation of small and medium-sized companies especially strong related to the availability of qualified and experienced employees. Not only is the number of qualified staff in medium-sized companies for the above mentioned reasons small, but it is also getting even shortened through the typical forms of work organization. Not - as you can often register in large companies - specialization is the problem, but mainly the engineers' overloading through a lot of side tasks. The development engineer has to fulfil several tasks at the same time: he works in sales; accompanies the manufacture and assembly or the work preparation for problems with new products, is responsible for the order of tools plus machines (Ehrlenspiel, 1995, p. 277ff). Interruptions and unforeseen tasks are normal for his or her daily routine. Time for NewPD is drastically restricted. Additionally there occurred due to the 3D CAD growth another side task to engineers in development departments of medium-sized companies. The 3D CAD revolution led to a personnel structural change in medium-sized mechanical development departments, which are responsible for the development of new products. Medium-sized companies were successfully conveyed that engineers can - on the side - easily take over product documentation with this 3D CAD software. Technical draughtspeople who did this kind of work so far declined rapidly. 1999 the German product development industry had 143.483 technical draughtspeople under social insurance contribution - 2011 there were only 120.379 left. The population index declined from 100 in 1999 to 84 in 2011. In the same time frame the population of German engineers increased from 637.935 to 708.476 people under social insurance contribution. The population index increased from 100 in 1999 to 111 in 2011 (IAB, 2011). As a consequence the overall ratio between technical draughts and engineers in Germany went from 0,225 in 1999 to 0,170 in 2011 which is a reduction of 24.5 %. The decline in German medium sized companies was even higher. As a matter of fact the 3D CAD software cannot produce the product documentation automatically and the engineer in medium-sized companies takes over the product documentation (mainly part and assembly drawings) which is intensive time consuming. One of the engineer's main tasks lies in the conceptualization of future and innovative systems. It is a complex process which requires both analytical skills and creativity to generate innovative solutions for the next generation of commercial products. Developing new concepts for products is a creative field of activity where engineers use their knowledge well-directed in order to give systems particular functions, forms and traits. Owing to the above described engineer's overload with side tasks (multi-functionality), in practice proven concepts which offer with given resources the best possible solution are often preferred (Ehrlenspiel, 2007, p. 241 sqq.). These exploitation processes with their unsound fixation to existing solutions is one big hurdle for innovation (Kliesch-Eberl and Eberl, 2009).

The main task of technical draughtspeople is the drawing up of norm-proven technical drawings as draft, itemization or assembly drawing in form of outlines, details, views and sections. Besides they are responsible for technical documentations and they carry out project entries, evaluations plus calculations. In the course of the management project "Socio-economic analysis of technical draughter integration in NewPD processes in mechanical development departments of medium-sized companies: A concept to cope with increasing shortage of engineering resources", which is currently in progress, a coherent ratio between engineers and drafters within a 3D CAD NewPD environment should be found with the aim to carry out efficient, fast, innovative and competitive product development. The concrete research question is: Does the employment of technical draughtspeople in mechanical development departments of medium sized companies within a 3 D CAD engineering environment increase the economic and socio-psychological efficiency? And the basic hypothesis is: The higher the technical draughter's integration intensity in a 3D CAD product development project, the higher the economic and socio-psychological efficiency within that project. To validate this hypothesis the mentioned management project consists of a theoretical part, a clarification of common scientific and logical rules and the empirical observations, analyzed by a cause-effect-model. This paper select one of the essential areas to establish an efficient development team, the cross-functional team composition by considering scientific literature and relevant research results on the one side and the placement and tracking of that aspect in the cause-effect-model (part of that management project in preparation) on the other side.

2. Literature Review - Theoretical and empirical Evidence

2.1. Weakness of traditional functional Organization

The humanization movements in the first half of the 20th century created with the attempts to overcome the negative consequences of Taylorism by job enrichment, job enlargement, use of different abilities etc. (Staita, 2012) led to a change in the business climate which in the second half of the 20th century imposed new roles for business organization and style of leadership. This reconsideration of the business structures had to follow nearly inevitable the new understanding of humans in the working environment and the so far rigid organizational structures obtained practical and scientific interest. And – not coincidentally – we find already in the year 1966 in one of the standard references of business administration (Gutenberg 1966, pp. 262) in the section, describing the pattern of cooperation, a link to American management literature, discussing cross-functionalization or -contacts since the early 50s (Dale 1952, Peterson et. al. 1953). Scientists as well as practitioners quickly hypothesized that there is much more potential to be revealed by using human diversity adequately in success related processes. By taking the process of design and NewPD - a common application in praxis and theory for demonstrating the changes in business organization - the initial situation is described in detail by Ehrlenspiel (1995, p. 119 sq.). You can hardly better start the discussion than to look at Ehrlenspiel's figure 4-1-22, p. 148, figure 1 in this paper. He shows in a highly simplified way the process of building new products in a conventional, functional organization. Although every task within a department may be/is optimized the idea of the final outcome, the competitive product ready for the market, is not really in the center of the respective minds and the activities.

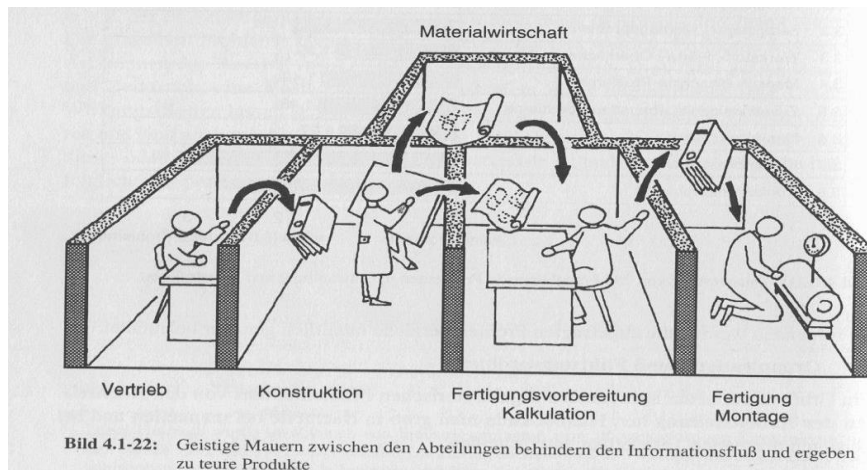


Figure 1. Mental walls obstruct the flow of information between departments and result in expensive products
Source: Ehrlenspiel 1995, p.148

According to Ehrlenspiel's experience this attitude, he is calling it “Mauerdenken”, is the main reason for waste of time and for quality and cost problems in companies. This experience is shared nearly by all members of staff, every company, all hierarchical positions and every line of business. Not surprising that this ranking leads to the “faster competitor” as a new category of challenge in a harder global competition.

With the example of the building of a new auxiliary heater for the automobile industry a bundle of reasons for time, quality and cost problems have been collected by Ehrlenspiel under this organizational environment: vague definition of aims, inadequate communication, operation scheduling and coordination, insufficient use of methods (e. g. market analysis, risk analysis), disregarded individual human behavior (e. g. small communication of introvert persons) etc. One of the major points is the adequate flow of information and any disturbance lead inevitably to an increase of changes with its inevitable additional cost and time and possible loss in quality. What must get subject to greatest attention is - apart from the normal run-off - the feedback of relevant information at the right time. To put that in operation and to bring again the final outcome, a high-class product, into the center of all activities of a company there is an urgent need to tear down the department walls by establishing a new integrated, innovative thinking, a change of the formal organizational structure and an adjustment of the style of leadership.

The following figure 2 indicates the high intensity of the flow of information, downstream as well as upstream, the feedback, ideally to be allowed for a successful building of new products. Core feedback information are coming from the production and the market area. Due to the great effects on production cost resulting from R&D close coordination in respect to best available production facilities (machinery, skill of

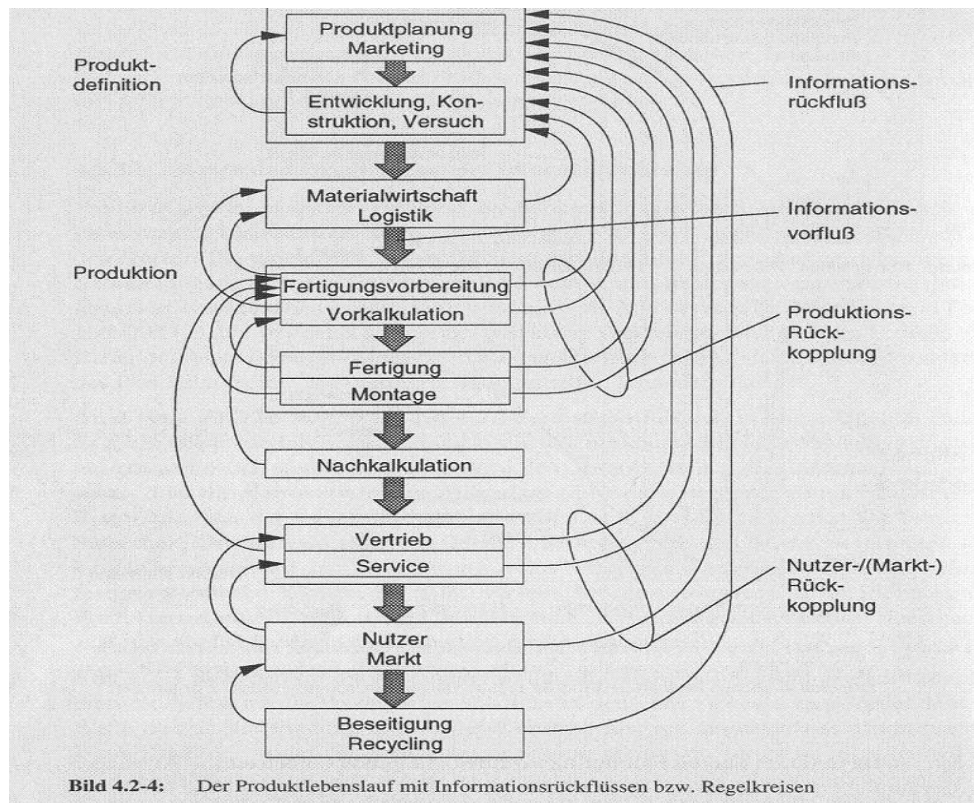


Figure 2. The product life cycle with information loops respectively feedback controlled loops
 Source: Ehrlenspiel 1995, p. 156

employees etc.) is to be cultivated. Tight cooperation with the market area makes sure that the requirements of the customers are regarded adequately - without losing the benefits of standardization. These balancing processes about possible but not literally necessary traits of a new product are of high priority in respect of product cost, which get determined up to 80 % in the development departments (Ehrlenspiel 1995, p. 555) and these balancing processes are deeply simplified in an environment of the required new integrated, innovative thinking. But even with this new understanding figure 2 actually calls for more transparency of the process of building new products. The trouble is that with the conventional, functional organization the flow of information is regimented by a huge number of official points of intersection (interfaces) creating a huge number of documents, cost and - waste of time.

Ehrlenspiel (1995 p. 157) quotes an assessment of the management consultant A. D. Little, resulting in the statement that one third of the original costs incurred to overcome the official points of intersection. And the aggregated time for transfer, the idle periods and the break-in time amount up to 90 % of the complete lead time of an order (Führberg-Baumann and Müller 1991, p. 52 sqq.).

2.2. Cross-functional Team

The main concern must be to reduce the flood of information transports and documents by a radical change of the organizational structure accompanied by an adequate style of leadership and to establish a team with team members from all relevant functions, a cross-functional team. The composition of the team, a genuine leadership function, may differ, depending of the individual characteristic of the project in general and with the progress made (e. g. a lawyer must not always be available). The consequent and radical transition from all the individual functions detailed in figure 2 is made with figure 3, the information flow in a cross-functional team: The necessary information can flow directly from expert to expert within the team and without the bulk of official documents.

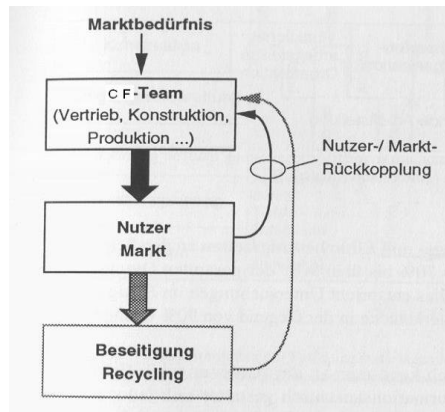


Figure 3. Information flow in a Cross-Functional Team

Source: Ehrlenspiel 1995, p. 157

There is only one essential feedback left, the information from the market, from the - potential or actual - user of the new product. As already mentioned in section 2.1 first ideas to create teams to overcome many obstacles within companies can be found about 60 years ago. The commencements can be seen in councils, committees, commissions for temporary meetings of members with different background, different functional experience, different organizations etc. with the intention to solve a special problem (Heinen 1974, p 157 sqq.). The expectation is that these kinds of groups have better chances to create new solutions for a given task due to the diversity of competences, due to short/quick flow of information and due to better coordinated and balanced decisions.

In the meantime these ideas have become more popular in commercial organizations using the expected benefits as indicated above as well as the additional ones, described already under the section “Weakness of traditional functional organization”. 12 Manage defines: “The aim of this type of clustering of people is to boost diversity as it enhances creativity and social collaboration and to make sure that the various departments of the organization have a say in the project” and “are equally represented in the team”. Subjects of these cross-functional teams are e. g. company strategy, cost saving programs, implementation of new technology etc., but the key application area for cross-functional teams - as elaborated above - is in design and NewPD (see also Haon et al. 2009). Both need creativity, input from a wide range of competence and vision to reduce cost, product development time and time to market in a way that preserves flexibility towards market changes.

2.3.Effects of competence (cross-functional) diversity on performance of NewPD – and the function of leadership

Haon et al. (2009) analyzed eighteen surveys made to observe direct effects of functional diversity on the performance of NewPD during the years 1988 and 2005. These surveys examined about 2000 projects/teams and more than 1400 managers had been interviewed.

The results were heterogeneous as well as ambiguous. The overall conclusions range from “Projects developed by cross-functional teams have a higher success rate than those from a single company function” (Larson and Gobeli, 1998) over “Diversity has a direct negative effect on the performance perceived by members of the team itself and on product innovation” (Ancona and Caldwell, 1992) to “Cross-functionality is associated with a higher success rate of new products” (McDonough, 2000).

To get a deeper understanding of the causes behind that heterogeneity Haon et al. (2008) decided to perform further surveys. What is obviously important for the success of cross-functional teams is not only the functional diversity as such, various conditions must be met to make a cross-functional team successful. Only the number of functions represented in a team is of marginal significance. The diversity of information and perspectives companies want to get, results to a large extent from competence diversity which cannot necessarily be achieved only by functional diversity. Individual competence, a cross-functional human property by nature (Javidan 1998), and a mixture of origin, cultural background, education, life career and professional career, experience and expertise, may differ largely within a functional department and may be relatively similar from members of different ones. With that understanding the notion diversity is extended to a compound term of functional, educational, experience and expertise diversity; this - extended - diversity has a positive influence on information and knowledge available in a team and enables the team for deeper thinking and for the creation of a broader range of perspectives considered to make decisions (e. g. Dahlin et al. 2005).

Under those conditions the possibility to develop a higher amount of different concepts for NewPD exists. On that broad base the team should be capable for a better instrumental use of success related information to solve specific problems. In the specific context of NewPD, the three main types of success related information pertain to information about customers, competitors and technology (Henard and Szymanski 2001).

All that describes the more functional say the mechanical aspect of possible success with teams, the potential embedded in teams. But as teams are constructs of individuals the socio-psychological aspect of team work and team leadership need adequate respect in order to make actually use of this huge potential. People tend to work with others who are - subjective perceived - similar to themselves, who have - subjective perceived - complementary skills, who have - subjective perceived - instrumental skills relevant to the group task and with whom they have worked already successfully in the past (Hinds et al. 2000); therefore diversity in a team is not by nature really qualified to establish the intended collaborative climate. Being aware of the negative implications of group dynamics team rules are helpful and commonly agreed at the very beginning of the activities. Such rules can be found in any groupings, political, commercial or sports and the rules in general consist of: be a good teammate, be part of the solution not the problem, professional conduct on and off the floor, total mutual support, put the team first (e. g. see FCB Basketball-Section-OVB 09.02.2012), and clarify goals and deploy them to all team members etc. (Kotelnikov n.d. - Toyota). These rules are subject to a careful management by a team leader, well-resourced with social competences. The motivation of the team members to achieve a common goal gets first priority. The question is, has the leader the personality and the leadership skills that make team members want to follow his way. When looking at the range of possible styles of leadership from the one extreme of commanding to the other extreme of a cooperative leadership (Heinen 1974, p 529), there is obviously a more participative (cooperative) style of leadership required, playing more a role of boundary spanning actor.

What is - apart others - helpful to overcome possible obstacles in respect to trust, generous share of information, open communication, reduced fear of peer judgment, easy, tacit understanding etc. is to a certain extend familiarity (Hinds et al. 2000, Haon et al. 2009). Also a study executed by Janssen et al. (2000, p 162 sq.) indicated that higher familiarity led to more critical and exploratory group norm perceptions, and more positive perceptions of collaboration.

Taking all this into account Haon et al. (2009) developed the three hypotheses for NewPD teams:

(1) Greater competence diversity increases the degree of instrumental use of available information,
(2) higher degree of instrumental use of available information improves the performance of the new products and 3) stronger familiarity among team members intensifies the positive effects of competence diversity on the level of instrumental use of available information. Figure 4 visualises the complexity of that causal model quite clearly.

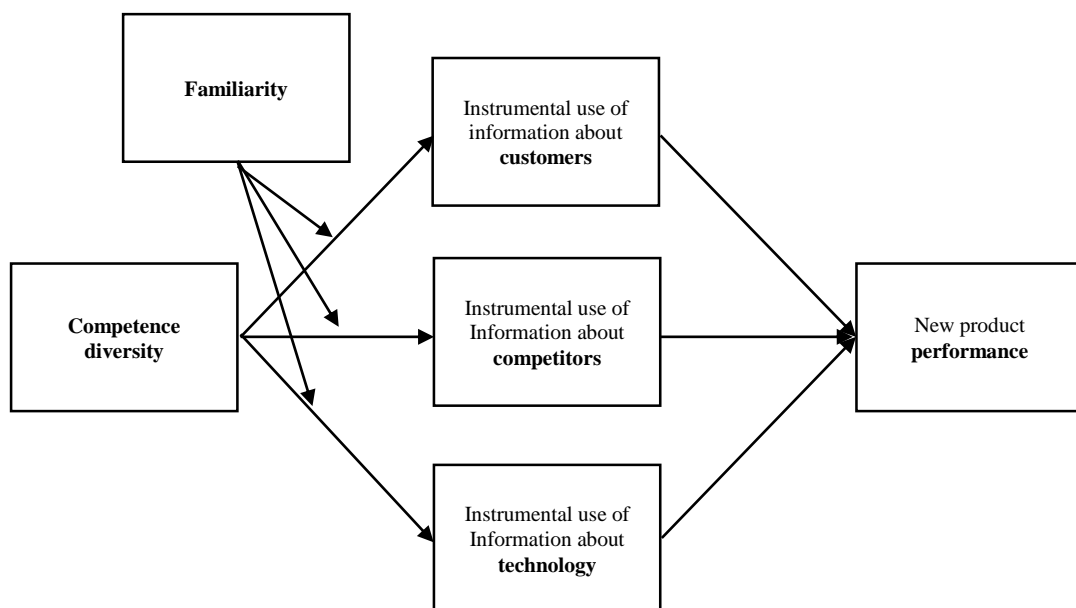


Figure 4. Research Hypotheses

Source: (Haon et al. 2008 – modified by the author)

2.3. Survey results of Haon et al.

To validate their hypotheses - and to show that the undifferentiated use of diversity and ignoring familiarity by managers and team leaders are above all responsible for the heterogeneous outcome of the surveys made during the years 1988 and 2005, as described above - (Haon et al. 2008) survey NewPD teams by interviewing one respondent from each team who has taken part in a recent development project and can describe that project effectively. For large firms, they interview product managers, for small and medium-sized enterprises sales managers; the respondents represent all 58 French industrial sectors. Special attention was directed to a elaborate reference/discussion of the adequate methods used for the analysis of all collected data in respect of reliability and validity, comprising the terms as formative indicators, index construction, multicollinearity, variance inflation factor, exploratory factor analysis, convergent and discriminant validity, path analysis, confirmatory factor analysis etc., according to the latest state of the art to examine cause-effect relations in social sciences, outlined for example by Eberl (2004) or Weiber and Mühlhaus (2010).

In fact this solid analysis confirmed the hypotheses to a broad extend. What was not validated is the interaction between familiarity and diversity on the use of information about customers. "This effect could indicate that information about customers is considered central to developing new products and, as a consequence, is used regardless of who the team members are" (Haon et al. 2008, p 82 sq.). Nevertheless there are strong arguments for the importance of familiarity, as the moderating effect concerning diversity and instrumental use of information about competitors and technology is highly significant. It is just the benefit of the detailed design of the model of Haon et al. (2008) that the crucial characteristic of familiarity is made evident for managers and team leaders.

3. Research - Premises, Methodology and Analysis

3.1. Conclusion and Implication on the Research Question

From a general managerial point of view - and this includes the viewpoint of mechanical development departments of medium-sized companies within 3D CAD conditions - the summary of the discussion of cross-functional teams and leadership range from a need to change the terminology to personal development aspects, to rules for the composition of teams and to some vital traits of leadership in that specific environment:

- The idea behind cross-functionality is more precisely addressed by competence diversity. Therefore the term cross-functionality is better replaced by competence diversity as only competence diversity can guarantee that variety of information and knowledge required for optimal decision making, which cross-functionality is not necessarily able to establish. Talking of competence diversity teams rather than cross-functional teams is more operational in respect to the actions to be taken by managers and team leaders composing coherent teams.
- Human resources departments should promote and control interpersonal diversity by hiring and training and thus support the team composition processes.
- When designing a team diversity and familiarity aspects must play the key role from the very beginning.
- To obtain the positive effects of competence diversity on new product performance management and team leader must actively encourage the team members to make use of the richness of information and knowledge available by competence diversity.
- As competence-diversity-benefits can be leveraged through higher familiarity among team members management and team leader must highly emphasize the development and maintenance of a productive collaboration climate.

Since globalization has already captured wide areas of all business activities the composition of new teams is no longer restricted to team members of a single cultural circle. Therefore the next question to be investigated is how cultural diversity effects competence diversity and leadership? Which measures are to be taken for a coherent combination of multicultural competences, e. g. education of undergraduate or graduate students in multicultural management skills, limited deployment abroad etc.? One conclusion already drawn from a study conducted by Ho Chye Kok (2007) is that the successful management of tacit organizational knowledge sharing requires a deep understanding of the specific cultural values that underpin both behavior and organizational culture.

Another problem could arise from the viewpoint of individual work satisfaction. As team members perceive an additional pressure to success they may expect some compensation by corresponding rewards. Will these hopes be met or is there a new way of exploitation of labor emerging.

The results obtained by this discussion of competence (cross-functional) diversity and leadership are

- as already stated - applicable in general i. e. for major industrial enterprises as well as for mechanical development departments of medium-sized companies within 3D CAD conditions, the subject of the management project in preparation referenced under paragraph 1. This paper is understood to contribute to this project discussing measures for the establishment of coherent team structures. The proposal intends to demonstrate that management in focusing continuously on the improvement of organization to enable technology innovation or to cope with the challenges of the world wide finance and economy crises or to increase operational effectiveness must not lose the view for the single working units in their companies. For example by analyzing the deployment of an all commercial processes integrating software (e. g. 3D CAD) there is easily danger to pass out of mind the everyday work life of single productive units. To create competence diversity is not only a global organizational task, management must in parallel integrate this requirement adequately into single productive units to enable efficient work. Further research should be carried out under deeper consideration of this aspect.

3.2. Causal Model

Coming back to the basic hypothesis: "The higher the technical draughter's integration intensity in a 3D CAD product development project, the higher the economic and socio-psychological efficiency within that project" outlined under paragraph 1 an evident outcome of that functional/competence diversity discussion is that in the process of constructing rules for the composition of a coherent team structure in mechanical development departments of medium-sized companies competence diversity and familiarity must be taken into account adequately. The placement and tracking of that aspect in the cause-effect-model designed for the related management project is indicated with figure 5. The causal model for socio-economic analysis, which is in generation, shows possible cause-effect relations between different team constellations in NewPD teams under 3D CAD conditions and the economic and the socio-psychological efficiency. The structural dependent variable Y, the economic efficiency, will be measured by the endogenous latent variables as meeting of project deadlines, the workload, project costs, project duration, the number of concepts, the number of drawing errors and the long term benefit to counter the shortage of engineering resources. The structural dependent variable Z, the socio-psychological efficiency, is indicated by the engineer's methodical responsibility during the creative phase of product development, the engineers/drafters contentment with the employment and the acceptance with the project proceedings. The independent structural variable X, the technical draughters integration intensity in a 3 D CAD NewPD project, is indicated by the distribution of drawings which must be generated in a defined standard project, the team structure and the education level of the team members (degree of compliance with the NewPD task), all further NewPD activities concerning product documentation and the NewPD training intensity of both the technical draughtsperson and the engineer, best explained with the call for competence diversity. The main flow of possible impacts of cross-functionality resp. competence diversity expected on X, Y and Z is specifically marked in red. The actual strength of the expected effects will be identified applying two methods. On the one side a broad-based study is in preparation in medium sized companies using questionnaires. Participants of recent NewPD projects (variant constructions) - engineers and drafters - will be asked accordingly to falsify respectively verify the model. On the other side defined standard projects are to be executed at various levels of selected independent variables in an experimental field study. By arranging stress tests the model must prove its reliability. If the real environment and the model match for selected parameters, the conclusion can be drawn that the model reflects the aspects of reality sufficiently.

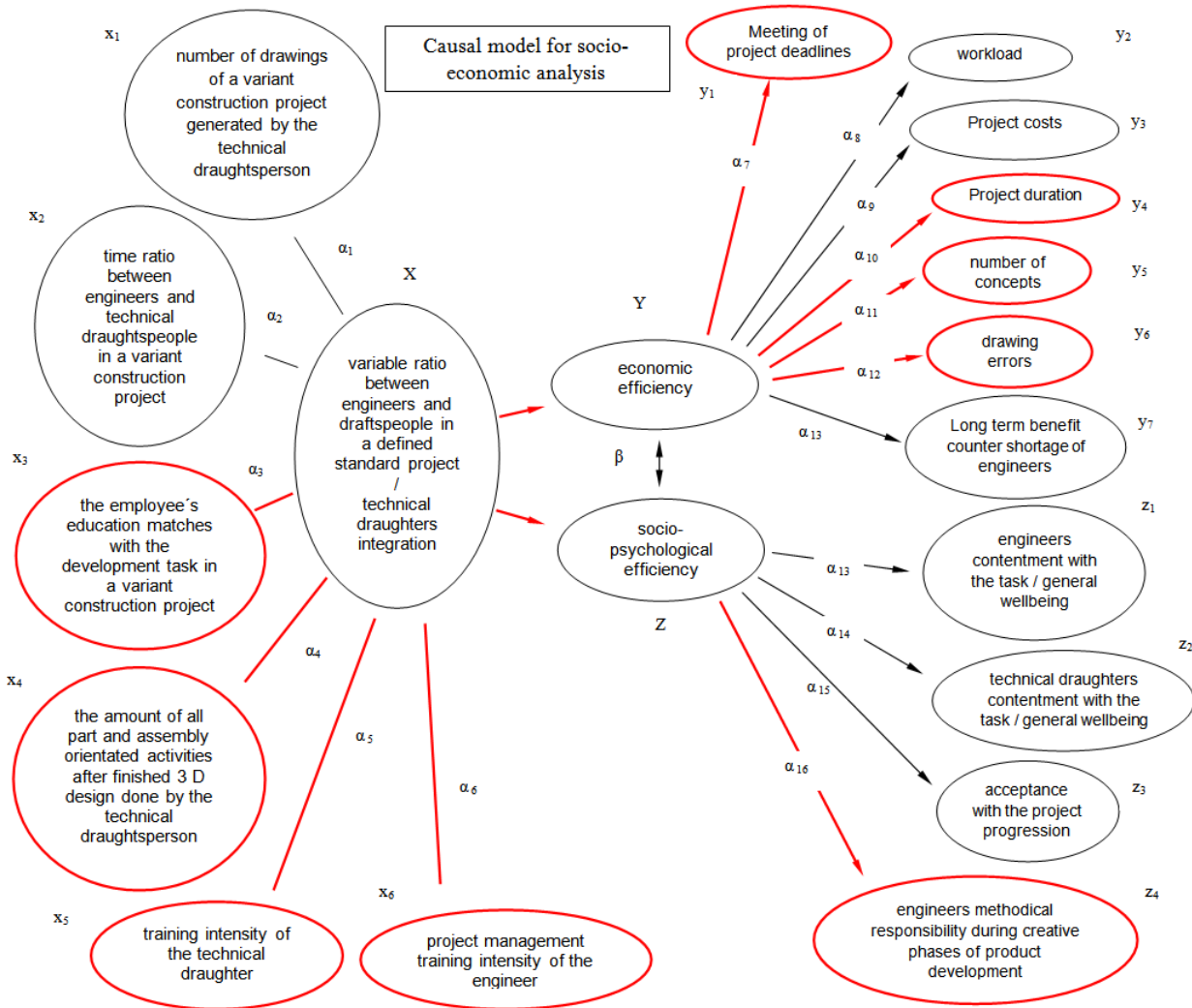


Figure 5. Causal Model - Main Flow of Impacts from Competence Diversity
 Source: Author

Legend for the causal model:

- X = independent structural variable
- $x_1 \dots x_6$ = latent exogenous variables (measurement variables)
- Y, Z = dependent structural variables
- $y_1 \dots y_7$ = latent endogenous variables (measurement variables)
- $z_1 \dots z_4$ = latent endogenous variables (measurement variables)
- $\alpha_1 \dots \alpha_{16}$ = correl. degrees of dependence between structural & measurement variables
- β = correlative degree of dependence between dependent structural variables

4. Discussion and Conclusion

With this paper a central elements of the causal model in discussion is addressed. Further components such as division of labor, modern PD methods and task satisfaction respectively cognitive dissonance must be considered accordingly in order to elaborate a solid theoretical and empirical basis necessary to supported the assumption of causality (Weiber & Mülhhaus, 2010, p. 13 sq.). After these additional comprehensive studies the scientific evaluation of the proposed causal relation between a coherent team structure and socio-economic efficiency in selected areas of NewPD within a 3D CAD environment can be performed and conclusions and suggestions inferred. A coherent solution for the imbalanced allocation of personal resources in NewPD is likely

5. References

- Ancona, D. G., and Caldwell D., 1992. Demography and design: predictions of new product team performance. *Organization Science* 3, pp. 321-341.
- BMBF 2004. *Bundesbericht Forschung*. <http://www.bmbf.de/pub/bufo2004.pdf> (accessed 12 11, 2005).
- BMBF 2011. Bundesregierung setzt konsequent auf Bildung und Forschung - 06.07.2011 [Pressemitteilung 095/2011]. <http://www.bmbf.de/press/3121.php> (accessed 12 08, 2013).
- Dahlin, K. B., Weingart, L. R., and Hinds, P. J. 2005. Team diversity and information use. *Academy of Management Journal* 48, no. 6, pp. 1107-1123.
- Eberl, M. 2004. *Formative und reflektive Indikatoren im Forschungsprozess: Entscheidungsregeln und die Dominanz des reflektiven Modells*. 19. München: EFOplan.
- Ehrenspiel, K. 2007. *Integrierte Produktentwicklung: Denkabläufe, Methodeneinsatz, Zusammenarbeit*. München/Wien: Hanser.
- Ehrenspiel, K. 1995. *Integrierte Produktentwicklung. Methoden für Prozessorganisation, Produkterstellung und Konstruktion*. München Wien: Carl Hauser Verlag.
- Führberg-Baumann, J. and Müller R., 1991. Neugestaltung der Auftragsabwicklung. *VDI-Z133*, pp. 52-57.
- Gutenberg, E. 1966. *Grundlagen der Betriebswirtschaftslehre. Erster Band: Die Produktion*. Berlin etc.: Springer.
- Haon, C., Gotteland D. and Fornerino M., 2009. Familiarity and competence diversity in new product development teams: Effects on new product performance. *Market Lett* 20, pp. 75-89.
- Heinen, E. *Industriebetriebslehre*. 3. Wiesbaden: Gabler, 1974.
- Henard, David H. and David M. Szymanski. "Why some new products are more successful than others." *Journal of Marketing Research* 38, no. 3 (2001): 362-375.
- Hinds, P.J., Carley K.M. and Krackhardt D. 2000. Choosing Work Group Members: Balancing Similarity, Competence and Familiarity. *Organization Behaviour and Human Decision Processes* 81, no. 2, pp. 226-251.
- Hirzel, M. 1992. Mit Geschwindigkeit im dynamischen Markt reüssieren. (Eds.), *Speed-Management: Geschwindigkeit zum Wettbewerbsvorteil machen*, by Hirzel/Leder/Partner, 19-26. Wiesbaden: Gabler.
- Ho-Chye-Kok. 2007. Cultivating Knowledge Sharing: An Exploration of Tacit Organizational Knowledge in Singapore. *Journal of Asian Business* 22/23 Issue, no. Issue 2/3/1, pp. 169-187.
- IAB 2011. Berufe im Spiegel der Statistik. Edited by Institut für Arbeitsmarkt und Berufsforschung / Forschungseinrichtung der Bundesagentur für Arbeit. <http://bisds.infosys.iab.de/bisds/result?region=19&beruf=BG60&qualifikation=2> (accessed 11 29, 2013).
- Janssen, J., Erkens G., Kirschner P. A. and Kanselaar G. 2009. Influence of group member familiarity on online collaborative learning. *Computers in Human Behaviour* 25.
- Javidan, M. 1998. Core competence: what does it mean in practice. *Long Range Planning* 31, pp. 60-71.
- Kliesch-Eberl, M. and Eberl P. 2009. An extended perspective on innovation: Bridging organizational creativity to dynamic capabilities. *EGOS Colloquium, Barcelona 2009*. Barcelona: EGOS Colloquium, pp. 1-6.
- Kotelnikov, V., n.d. Cross-functional Management (CFM) - Building a Better Synergistic System for Quality, Cost, and Delivery, and Innovation (Toyota). http://www.1000ventures.com/business_guide/mgmt_cross-functional.html (accessed 12 10, 2013).
- Larson, E. W. and Gobeli D. H. 1988. Organizing for product development projects. *Product Innovation Management* 5, no. 3, pp. 180-190.
- McDonough, E. F. 2000. Investigation of factors contributing to the success of cross-functional teams. *Journal of Product Innovation Management* 17, no. 3, pp. 221-235.
- Scheer, A-W. 2003. *Real-Time Enterprise: mit beschleunigten Managementprozessen Zeit und Kosten sparen*. Berlin: Springer.
- Weiber, R. and Mühlhaus D. 2010. *Strukturgleichungsmodellierung*. Berlin Heidelberg: Springer-Verlag Berlin Heidelberg.
- Wittenstein, A-M. 2007. Bedarfssynchrone Leistungsverfügbarkeit in der kundenspezifischen Produktentwicklung. *IPA-IAO Forschung und Praxis*. Heimsheim: Jost Jetter Verlag.
- 12manage. 2013. http://www.12manage.com/images/picture_cross_functional (accessed 12 15, 2013).



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