A Research on the Effects of R & D Based Innovation Activities and Strategic Human Resource Management on Sustainable Competitive Advantage

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The aim of this research is to examine the effects of R&D based innovation activities and strategic human resource management on sustainable competitive advantage. In the research, R&D based innovation activities and strategic human resource management were considered as independent variables and sustainable competitive advantage as a dependent variable.

The research is expected to contribute to the theoretical and practical aspects of the literature. The theoretical contribution of the research is that the effects of R&D based innovation activities and strategic human resource management on sustainable competitive advantage are examined in a holistic model and fill this gap. The contribution of the research practice, the effect on the sustainable competitive advantage of R&D based innovation activities and strategic human resource management are tested.

Keywords: R&D, Innovativeness, Strategic Human Resource Management, Sustainable Competitive Advantage.

Introduction

R & D-based response studies and strategic human resources management are the most important elements of sustainable competitive advantage. With technological change and rapid development along with globalization, businesses need to monitor new production and management technologies as well as protect existing technologies. By following technological developments, businesses will gain a competitive advantage by making the change and transformation appropriate for them.

Among the resources they have, the research and development (R & D) capability and knowledge and technology-equipped human resources are at the forefront of change, adaptation and innovation. For this reason, businesses operating in an environment where they are constantly improving are in a position to find new areas of use for existing products and to develop new product and production techniques in order to survive and survive rapid and radical changes (Zerenler et al., 2007). Strategies to find the key people to move applications, to recruit, to train, to make career planning to help them rise to the top step, working to raise the motivasiyo will increase their loyalty and to protect the investment made to the important people in human resources practices and activities of high strategic value.

In this context, R & D activities are a key concept for productivity, innovation, economic growth and competitiveness all over the world and serve as the main locomotive (Kaya, 2009). Creation of new technology, original idea and product development together with advanced engineering know-how requires creation and development of R & D culture (Zibiao et al., 2011).
R&D Based Innovation Activities

R & D is regarded as an important resource in the discovery of new products, new production techniques, new information and new processes. R & D includes creative work that increases knowledge stock and uses this stock to design new applications and discoveries (Frascati, 1993). This definition in line with the company’s new products and / or invests primarily in R & D in order to improve service. In order for a sustainable R & D structure to be established, it is important for the company to adopt the vision of continuous improvement and change. This vision of the company for any product "adequate" concludes Odense; the response from the paved should be innovative with a "better" approach, no matter how positive it is.

R & D: It is made up of regular creative work to increase knowledge, including knowledge of society, culture and people, and to use it in new applications. In a narrow sense, R & D is the whole of systematic and creative works aimed at finding new products and production processes in enterprises (Demirci et al., 2006). The information obtained as a result of R & D activities is used to develop a new product and production method and to uncover a new market. This information contributes to the development of firms by increasing their competitiveness. The information produced at a firm is rapidly spreading to other firms in the region thanks to technology and network systems, contributing to the development of the region. R & D expenditure is a key indicator of the efforts of the private and public sectors to gain competitive advantage in science and technology. R & D includes creative work that increases knowledge stock, uses this knowledge for new applications, and is based on a systematic basis.

Innovation is considered to be one of the most fundamental elements of economic growth and development, and therefore prosperity and quality of life, for both countries and companies to gain competitiveness in the national and international arena, to increase productivity. According to the OECD’s findings, the contribution of innovation in the economic growth of the developed countries especially in the last 25 years is more than 50% (Soyak, 2008).

The concept of innovation has been identified with J. Schumpeter in the literature. Schumpeter has defined innovation in a narrow sense as developing a new production function. According to Schumpeter, innovation involves creating a new product, developing a new production method, establishing a new market, developing new resources for the raw material or semi-finished material, and creating a monopoly situation. activities (Kurz, 2006).

Innovation is the application of a new or significantly improved product (goods or service) or process, a new marketing method or a new organizational method in business practice, workplace organization or external relations (Oslo, 2005). The transformation of innovative movements into economic and social values will only be possible if they are effectively marketed. That is, unless a new product, service or business model is introduced, it will not be considered innovation unless it is subjected to an effective marketing process (Kılıç, 2013).

It is a fact that it is not so easy to change the cultural structures of the enterprises in a very short time and to easily change them to an innovative structure. As a result, it will not be easy for an
employee who has been working with the same technique and technology for many years to adapt to a new technique years later and to have a creative structure that produces constant innovations. Establishment of innovative cultures in enterprises and an innovative structure of businesses (Oden, 1997).

Building a culture that encourages and encourages employees to innovate and easily access new ideas and information will enable them to develop relationships both within and outside the organization. In this way, the organization will have the innovative effort contribution of both employees and partners outside the organization, customers, intermediaries and suppliers through its employees (Uzkurt, 2008).

Innovation is not about inventing the undiscovered; aims to discover ways of creating value. For this reason, ideas and concepts gain importance. Innovation requires commercial success. Making an invention from the other side can not guarantee the commercial success of that invention. No value can be created as long as a product with commercial value does not emerge from the compound (Elçi, 2006).

Innovation refers to the introduction of new methods in social, cultural and administrative settings, but in the simplest sense, the conversion of information into utility. Innovation is the process of using information and ideas to create beneficial results. In terms of businesses, it provides significant competitive advantage as it improves innovation, productivity and profitability, and allows new markets and existing markets to expand (Elçi, 2007). His concept is also defined as finding different and effective solutions by approaching situations and problems from a different point of view. Innovation according to the OECD is used to mean that an idea can be translated into a viable process (Taymaz, 2001).

Stevenson and Gumpert consider innovation as the heart of entrepreneurship (Stevenson ve Gumpert, 1991). In addition, the concepts of creativity and innovation seem to be closely related to each other. Thus whatever is created is new, and innovations lead to the development of human possibilities by promoting entrepreneurship and the spread of these possibilities (Bakan and Büyükbeş, 2004). Since innovativeness is seen as a competitive power in businesses, businesses must think and work in a way that they can innovate continuously (new product, new process, new technology, etc.) (Koçel, 2005). Innovation can have many sources. These can be summarized as unexpected events, needs, changes in the sector and the market, and differences in perception of demographic characteristics. An enterprise can be as efficient as it can make innovations as economically as possible. Businesses are using their innovation resources and resources more rationally, which leads to lower production costs and increased production (Güney, 2008).

Therefore, the form of collective behavior for the creation of an opportunity to value it within an institution, whether based on basic research or not, will be instrumental in the creation of a trend of innovation in that institution. Innovation trends in business behavior by supporting new ideas and projects to develop new products or services will directly affect that operator’s qualitative and quantitative performance criteria (Bulut, Fiş, Aktan and Yılmaz, 2008).
Strategic Human Resource Management

The strategic nature of the human resources management approach emphasizes that human resource practices are crucial to organizational performance in matters such as financial performance, labor turnover and productivity (Richard and Johnson, 2001). This implies that the overall performance of the organization is influenced by the application of "human resources" rather than all other organizational variables. The strategic structure of human resources management has been subject to many researches since the 1980s and has been tried to be explained by many researchers.

According to Miller, the strategic nature of human resources management is related to the decisions and behavior of implementing "organizational strategies" designed by the organization’s senior management to ensure organizational processes and competitive advantage (Chew ve Chong, 1999). Strategic human resource management is the design and implementation of an internally consistent set of policies and practices that ensure the achievement of company objectives and ensure human capital (Huselid, Jackson and Schuler, 1997). According to Mello, the strategic structure of human resources management means the development of policies, programs and policies compatible with each other in order to realize the strategic goals of the organization (Mello, 2002).

The main objective in determining strategic human resources practices in the highly competitive environment that emerges with globalization is to develop the best practices that will ensure the success of the adopted competitive strategy. The strategic structure of human resources management aims to integrate the human resources practices in organizations with the strategic and strategic needs of the company. In addition, it enables human resources practices to be recognized and used by managers and employees in the hierarchical structure as part of their daily work (Schuler, 1992).

Human resources are the management that ensures that employees who are the most valuable asset and contribute individually and collectively to achieve the goals that they have determined to be used efficiently, meet their needs and develop in professional care (Argon and Altay, 2004). In this context, human resource management can be defined as finding, using, and developing the right human resource to achieve goals in an organization (Akyüz, 2001). According to another definition, we can define human resources management as a strategic approach to procure, develop, motivate and acquire their loyalty as a key source (Bingöl, 1998).

With globalization, the capitalist defined products, services, ideas, knowledge and people as moving freely across national borders. As the economy becomes global and competition moves internationally, the knowledge, skills and abilities of employees have become the most important competitive source of a company (Cascio, 2003). Along with globalization, changes in the economic and social environment and technological developments have made companies more dependent on their human resources to achieve their goals (Baird and Meshoulam, 1988).

Inimitable and irreplaceable feature due to human resources, which has made important contributions to the understanding of sustainable competitive advantage. It is important that the
product that the customer wants is produced in the best quality and delivered at the best price and in the shortest time. To be able to do this, it is necessary for organizations to be open to innovation, to adapt easily to rapidly changing conditions, that is to be flexible (Erdut, 2002). Flexibility, which is dependent on the knowledge, skills and abilities of the employees and the employees who are required to sustain competitive advantage and technical resources, plays an important role in the emergence of human resources management.

With this unique philosophy, the best practices on human resource management functions, the creation of new jobs and positions that require close interaction and coordination among the groups, performance evaluation and rewarding to reflect longer term and group or team based successes, the creation of job and position structures, the promotion of new skills and skills for positions, the development of promotional systems based on equality from the market or external equality, and the creation of broad career paths to foster a wide range of talents, abilities and skills (Schuler and Jakson, 1987).

**Sustainable Competitive Advantage**

Competition is a concept that consists of all of the circumstances and conditions that affect the activities of businesses that are directly or indirectly trying to offer products or services. Competition between businesses; price, quality, service, support, etc. is based on a number of factors and is effective in the realization of the objectives of the enterprises (Yaşlıoğlu, 2016).

Porter, clearly explains sustainability as a long-term concept and therefore timetable, while explaining overall competitiveness strategies that can be traced to perform above the industry average, saying long-term performance above average is sustainable competitive advantage (Porter, 1985).

Barney describes sustainable competitive advantage as "a value-creating strategy application that can not be implemented at the same time by an operator, current or potential competitors, and can not be copied." The most distinctive difference of this definition from Porter's definition is the relevance of the possibility of being imitated, rather than linking sustainability to a particular calendar time (Barney, 1991).

It is also important to use and manage knowledge in creating competitive advantage. It expresses that the informant has taken its source in economies that want to establish a competitive advantage (Drucker, 1995). It is enough for the firm to be strategic in nature and unique to the company in order to create competitive advantage (Aadne, Krogh and Roos, 1996). Firms are generally deemed to have made a technical change by using a new product or service developed for it or by using a new method or input in production. The company that makes such technical changes for the first time is the company that leads the innovation and the business that this firm has made is innovation (Schmookler, 1966). Firms gain competitive advantage through innovation, which helps to capture competitive advantage in the marketplace with these new technologies and new business models (Porter, 1990).

It is not enough to get businesses to be more flexible and efficient, to provide better service to their customers than their competitors, and to develop their strategies in this framework, with the need for
competitive advantage. Undoubtedly, effective setting of targets, effective environmental and resource analysis, development of appropriate strategies, prioritization, systematic and technologically harmonious combination are effective factors in obtaining successful results. But it is only possible with the qualified human power that the business possesses that all these are passed on to life and to concrete business results (Özgeldi, 2002).

Because differences in all kinds of strategies, originality and strength that mimic elements of uncontrollability, is the difficulty of resolving its external observation which will ensure that the knowledge of human factors, knowledge, experience, skill and expertise from each other in that it has different hardware (Altuntuğ, 2009). The most important source of sustainable competitive in this case, it can be said that businesses have the mental and emotional accumulation of human resources (Reed and De Filippi, 1990; Baudreau and Ramstad, 2005). Thus, the success of the company, aware of the strategic nature of this valuable resource will increase depending on the evaluation effectively and efficiently. In this framework, the understanding of strategic human resources management requires enterprises to contribute to the realization of competition strategies through the development, direction and rewarding of the workshops, and to make decisions about the strategies and applications of human resources that are harmonious and integral with them. The main objectives of the strategic management of human resources management decisions and practices are (Barutçugil, 2004):

- To provide and maintain a competitive advantage,
- To support and strengthen the overall business strategy,
- Avoid concentrating too much on everyday problems,
- To cope with environmental changes,
- To ensure the participation of the administrators,
- Transform strategic plans into action

The implementation of these objectives, determining the right strategy for HRM function in accordance with the strategy and the competition will be possible to implement effectively. In fact, findings have been obtained that integrating human resources strategies and practices in line with the competition strategy contributed to achieving the objectives of the enterprises (Chandler and McEvoy, 2000).

Research

The Purpose and Importance of Research

The purpose of this research is to examine the effects of R&D based innovation activities and strategic human resource management on sustainable competitive advantage. In the research, R&D based innovation activities and strategic human resource management were considered as independent variables and sustainable competitive advantage as a dependent variable.

The research is expected to contribute to the theoretical and practical aspects of the literature. The theoretical contribution of the research is that the effect of R&D based innovation activities and strategic human resource management on providing sustainable competitive advantage are examined in a holistic model and filling the gap in this area. The contribution of the research in practice is that the effects of R&D based innovation activities and strategic human resource management on the sustainable competitive advantage are tested.
Variables and Model of Research

In this research, the relationship between R&D based innovation activities and strategic human resource management and sustainable competitive advantage will be examined and our hypotheses with variables will be explained. The dependent variable of the research is the sustainable competitive advantage. The independent variables of the study are R&D based innovation activities and strategic human resource management.

Research Hypotheses

H1: There is a relationship between R&D based innovation activities and sustainable competitive advantage.

H1: There is a relationship between strategic human resource management and sustainable competitive advantage.

Scope of Research, Data Collection Technique and Main Mass

In order to explain the relationship between the independent variables of R&D based innovation activities and strategic human resource management and the sustainable competitive advantage which is a dependent variable, During the construction of the research, "Survey Technique" was chosen to collect data from the scene. Survey least university graduates and active within the borders of the Republic of Turkey has applied to people in experts working in companies operating in the field of information technology and higher positions. A total of 150 surveys were evaluated. The data obtained from the questionnaires were analyzed by factor analysis, regression and correlation, respectively.

Demographic Characteristics of Main Mass

The ages of the participants range from 25 to 55. 31,33% of the participants in this study were female and 68,67% were male. 38,67% of participants were single and 61,33% were married. 57,33% of those who participated in this research are university graduates, 34% are masters and 8,67% are doctoral graduates. When asked about how many years they have worked, it was seen that 10,67% are 1-5 years, 24,67% are 6-10 years, 30% are 11-15 years and 34,66% are 16-20
years. 22.67% were experts, 44% were directors, 20.67% were senior managers, and 12.66% were directors and superiors when looking at the occupational positions of the respondents.

### Demographic Characteristics Table

<table>
<thead>
<tr>
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<th>NUMBER</th>
<th>PERCENT</th>
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<td><strong>AGE</strong></td>
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<td>8.67%</td>
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<tr>
<td><strong>WORKING YEAR</strong></td>
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<td>1-5 YEARS</td>
<td>16</td>
<td>10.67%</td>
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<tr>
<td>6-10 YEARS</td>
<td>37</td>
<td>24.67%</td>
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<tr>
<td>11-15 YEARS</td>
<td>45</td>
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<td>16-20 YEARS</td>
<td>52</td>
<td>34.66%</td>
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<tr>
<td><strong>OCCUPATIONAL POSITION</strong></td>
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<td>EXPERT</td>
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<td>22.67%</td>
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<td>MANAGER</td>
<td>66</td>
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<td>SENIOR MANAGER</td>
<td>31</td>
<td>20.67%</td>
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<tr>
<td>DIRECTOR and SUPERIORS</td>
<td>19</td>
<td>12.66%</td>
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### Findings

**Exploratory Factor Analysis of variables observed**

Factor analysis was performed to test the construct validity of the scales used to measure the concepts in this study. Expressions dependent on research and forming independent variables were subjected to factor analysis.

Explanatory factor analysis method has been applied to reveal construct validity. As a result of the Bartlett sphericity test ($p = 0.000 < 0.05$), it is seen that there is a relation between the variables taken into factor analysis.

The KMO coefficient ($0.862$) was found. This result shows that the adequacy of the sample is good and the data set can be subject to factor analysis. According to the obtained result, factor test is suitable ($KMO = 0.862 > 0.50$).

As a result of the analysis, it was seen that some of the questions in the questionnaire fell more than one factor and some of them could not have any factor. Accordingly, the questions 1, 2, 7 and 8 of Strategic Human Resources Management, which are among the independent variables, Question 1, 2 and 3 were taken from R & D and Innovation Studies. Likewise, question # 1 was derived from the sustainable competitive advantage, which is a dependent variable. The results obtained by removing these questions from the analysis are given below in the factor analysis table.
Correlation Between Observed Variables

Correlations between variables (at a level of 0.01 significance) are as follows. Correlations between R&D based innovation activities and strategic human resource management (0.711), between R&D based innovation activities and sustainable competitive advantage (0.765) and between strategic human resource management and sustainable competitive advantage (0.880) are calculated.

<table>
<thead>
<tr>
<th>Exploratory Factor Analysis of variables observed</th>
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<tbody>
<tr>
<td>R&amp;D Based Innovation</td>
</tr>
<tr>
<td>R&amp;D - 4</td>
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<tr>
<td>R&amp;D - 5</td>
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<tr>
<td>R&amp;D - 6</td>
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<tr>
<td>Strategic Human Resource Management</td>
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<tr>
<td>SHRM - 3</td>
</tr>
<tr>
<td>SHRM - 4</td>
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<tr>
<td>SHRM - 5</td>
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<tr>
<td>SHRM - 6</td>
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<tr>
<td>Sustainable Competitive Advantage</td>
</tr>
<tr>
<td>SCA - 2</td>
</tr>
<tr>
<td>SCA - 3</td>
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<td>SCA - 4</td>
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</tbody>
</table>

Regression Between Observed Variables

The R & D based Innovation Activity and Strategic Human Resources Management independent variables introduced into regression analysis are the dependent variable, Sustainable Competitive Advantage, which is 87.3%. Sig. = 0,000 indicates that the model is statistically significant.
Nowadays, enterprises are in a war of survival under pressure of intense competition in national and international markets, regardless of their geographical location and scale. Businesses need to maintain competitive advantage over their competitors in order to survive and show high performance.

Businesses that accelerate their innovation efforts by ensuring the continuity of R & D activities in this challenging competitive environment can only achieve and maintain sustainable competitive advantage with the management of their qualified human resources and strategic human resources. Countries that have acquired sustainable competitive advantage can become wealthy, have a high level of economic and social welfare.

On the basis of countries and businesses, performance dimensions such as R & D investments, innovation capacity, qualified labor force employment and management, export ordering and advanced technology in exports are crucial for sustainable competitive advantage. In addition, innovators who pursue an idea in order to meet the demands of the society or the market in the environment triggered by the innovation, triggered other innovations by adding their creativity to their ideas by introducing their ideas and developing new markets that support global or local inland innovation, value-added products and services are emerging in terms of sustainable competition. In this context, instead of perceiving innovation as a linear or mechanical process, it is necessary to recognize that it is a process that requires multidimensionality and continuity.

There are a number of factors that determine the innovation capacity of countries and businesses, and not only individual skills or superior entrepreneurs or public support alone are sufficient for innovation. What is really needed is the need for an eco-system that supports innovation.

With the impact of rapidly changing environmental factors and competitive conditions, human resources have begun to play a more strategic role in corporate affairs than ever before. Human capital (intellectual capital) has come to the forefront and human resource management has become important for all sectors. The duties and responsibilities of human resources departments have also increased in parallel with this development. Human resources management is an important means of competing, especially because it is difficult to imitate. Because human resource management activities are very different from company to company. Cost, technology, production methods, functions of products, distribution methods and so on, which are known as traditional methods of competition, can easily be imitated.

**Result**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Standard Beta $ \beta $</th>
<th>t-value</th>
<th>p-value</th>
</tr>
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<tbody>
<tr>
<td>SHRM</td>
<td>0,557</td>
<td>12,098</td>
<td>0,000</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>0,316</td>
<td>7,238</td>
<td>0,000</td>
</tr>
</tbody>
</table>

$ R^2 = 0,873 $

$ F=164,344 $

Sig.: 0,000
Businesses have to find more innovative methods faster than traditional methods for competitive advantage. Because traditional methods are known and used by many people. Moreover, if the human resources function can answer the question of "sharing my knowledge, what will happen if I share this knowledge" in the minds of employees and maximize the information sharing and communication in a company, and if all their activities are done in a way to ensure good management of information, they will be one step ahead of their competitors.

Developing competition environment, especially R & D and information activities and strategic human resources management function have to be used very effectively in enterprises. However, in this way, in terms of competitive superiority, one step ahead of its competitors will take precedence and be influenced positively.

In this study, the effects of R&D based innovation activities and strategic human resource management traits on sustainable competitive advantage were evaluated. It is possible to say that these parameters have a positive effect on the sustainable competitive advantage of R&D based innovation activities according to their competitiveness levels and their innovative positions. In order to reach the targets set in economic development and development, it is necessary to give importance to human resource capital to be used in this process.

Increasing competition by finding new markets, new sources of raw materials, improving the technologies used in the production of new products/services and services, eliminating regional disparities in the environment of uncertainty and risk, adding value with manufactured products and services while keeping up with changing conditions, by following technological and market changes activities that increase employment and income levels will contribute to economic development and development by positively affecting the economic systems of the countries.

When we look at the findings of the study; R&D based innovation activities and strategic human resource management are factors that should be given great importance in terms of the availability of sustainable competitive advantage.

The research is expected to contribute to the theoretical and practical aspects of the literature. The theoretical contribution of the research is that the effect of R&D based innovation activities and strategic human resource management on providing sustainable competitive advantage is examined in a holistic model and filling the gap in this area. The contribution of the research in practice is that the effects of R&D based innovation activities and strategic human resource management on the sustainable competitive advantage are tested.

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