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The Potential Impact of Product Innovation on Employment in Healthcare Organizations

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ABSTRACT

The importance of innovation in the healthcare sector is increasing day by day. Another resource as important as innovation is the workforce. Innovation is the development of new technologies and methods and has a major role in improving the quality of healthcare services. It is seen that innovation increases accessibility in the healthcare sector and provides a more comfortable service to patients thanks to digital health applications. Another important resource that provides this service to the patient is the workforce. A qualified and open-minded health workforce plays a key role in providing quality and reliable health services; Thanks to the patient-oriented approach, patient satisfaction increases. Therefore, innovation and workforce in health are seen as indispensable values. The aim of this article is to try to reveal the impact of product innovation, which is an important pillar of innovation in health, on employment. While the emergence of healthcare products and devices to improve and improve the treatment processes of patients has led to the creation of new job areas in the healthcare sector; It can also contribute to the employment of new workforce within the sector.

Keywords: Innovation in Health, Product Innovation, Health Workforce, Employment

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Ürün İnovasyonunun Sağlık Kurumlarında İstihdam Üzerindeki Muhtemel Yansımaları

ÖZ

Sağlık sektöründe inovasyonun önemi gün geçtikçe artıyor. İnovasyon kadar önemli diğer bir kaynak da işgücüdür. İnovasyon, yeni teknolojilerin ve yöntemlerin geliştirilmesi olarak düşünüldüğünde; sağlık hizmetlerinin kalitesini arttırma noktasında büyük bir role sahiptir. İnovasyonun sağlık sektöründe erişebilirliği arttırdığı, dijital sağlık uygulamaları sayesinde hastalara daha konforlu bir hizmet sunduğu görülmektedir. Bu hizmetin hasta ile buluşmasını sağlayan diğer önemli kaynak ise işgücüdür. Nitelikli ve gelişime açık sağlık işgücü, kaliteli ve güvenilir sağlık hizmetlerinin sunulmasında kilit rol oynamakta; hasta odaklı yaklaşım sayesinde hastaların memnuniyeti artmaktadır. Bu nedenle, sağlıkta inovasyon ve işgücü vazgeçilmez değerler olarak görülmektedir. Bu makalenin amacı sağlıkta inovasyonun önemli bir ayağını oluşturan ürün inovasyonunun istihdam üzerindeki etkisini ortaya koymaya çalışmaktır. Ürün inovasyonu hastaların tedavi süreçlerini iyileştirmek ve geliştirmek amacıyla sağlık ürünlerinin ve cihazlarının ortaya çıkmasını sağlarken; sağlık sektöründe yeni iş alanlarının yaratılmasına ön ayak olmaktadır.

Anahtar Kelimeler: Sağlıkta İnovasyon, Ürün İnovasyonu, Sağlık İşgücü, İstihdam

1 Introduction

Developments in the field of technology together with the globalization process have led to unimaginable progress in the health sector. The transcendence of information and technology across borders and the rapid spread of medical research and subsequent developments among countries have enabled health services to be provided in a better quality [1]. Globalization, which can be defined as the disappearance of country borders, has also resulted in increased human mobility. In particular, health professionals have had the opportunity to work in different countries, enabling specialized personnel to work in a wider area and gain experience. In this process, the increase in product diversity and the introduction of new products to the market have on the one hand facilitated access to products; on the other hand, the production of new products has expanded the field of employment.

In today's environment where global competition is dominant and technological developments are advancing at an unimaginable speed, innovation has become the most powerful weapon of businesses in order to keep the advantage and not to lose the existing advantage [2]. As in other institutions, marketing and business management approaches such as customer satisfaction, customer orientation and customer loyalty are becoming increasingly widespread in health institutions. For health institutions, which absorb technological developments at a great speed, innovation is more prominent than in other sectors; therefore, it is important to use innovation in the right way.

When assessing the potential impact on employment in healthcare organizations, product innovation is a critical strategic tool for creating competitive advantages to realize sustainable development. These innovations have the potential to provide competitive advantages in the health sector through improving jobs, creating new business opportunities and enhancing existing services. In particular, advances in medical technologies can transform the way health institutions do business, helping them to deliver more effective and efficient services. However, the net effects of this process on employment require further research, including factors such as both the change in labor structure and how labor demand will be

shaped. In this context, the role and scope of product innovation in shaping employment in healthcare organizations should be further analyzed [3].

2 Innovation Concept

In its most general definition, according to the OECD's Oslo Guidelines (2005), innovation is defined as "the realization of a new or significantly improved product (goods or services) or process, a new marketing method or a new organizational method in internal practices, workplace organization or external relations" and comes from the Latin word "innovare" meaning "to do something new and different" [4].

According to Becker and Wishler, innovation is the first use of an idea by an organization with the same or similar goals [5]. Rogers, on the other hand, defined innovation as "any idea, method or entity whose acceptance is seen as a new phenomenon for any person or any other group or community" [6]. West and Anderson defined innovation as "Innovation can be defined as the effective application of processes and products that are new to the organization and designed to benefit it and its stakeholders" [7]. The fact that businesses have to produce new products or improve existing products in a continuous competitive environment has made innovation a continuous concept [8]. Innovation is the process of adding meaning to existing ideas or a newly emerging creative idea and transforming it into a capital and a product ready for sale [9].

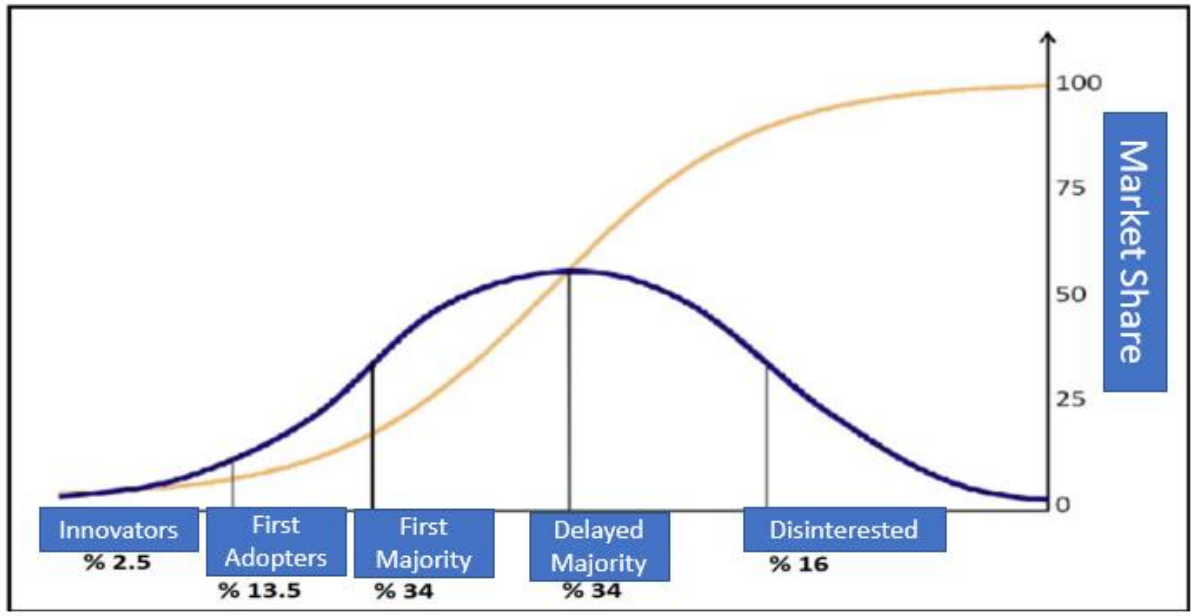

Figure 1: *Level of Acceptance of Innovation*

Source: Rogers, E. 2003: 247.

The acceptance of innovation by businesses varies from country to country and from sector to sector. However, every business that wants to gain a competitive advantage has grasped the importance of innovation, albeit with a delay, and those who remain indifferent face the danger of disappearing from the market. First of all, innovation, whether on the basis of product or process, enables the business to differentiate and take a few steps forward against its competitors. Thanks to innovation, customer orientation comes to the forefront; the product or service offered is produced within the framework of quality standards.

The rapid technological transformation experienced in recent years directly or indirectly affects people's lifestyles and sociocultural environments [10]. Innovation is a potential source of value creation for businesses and plays a vital role in national competitiveness and productivity. Innovation provides opportunities through the development of new technologies, the discovery of new markets and the enhancement of business value. Moreover, innovation, when combined with factors such as unique capabilities, know-how and experience, plays an important role in explaining differences in performance between different businesses [11].

Modern businesses attach great importance to improving their innovation capabilities and results by maximizing the advances brought about by technological innovation. At this point, organizations have realized the importance of increasing their competitive advantage, improving innovation performance and transforming their processes, especially by incorporating digital technologies into their operations. This rapid digital transformation of the business world offers businesses the opportunity to increase their ability to deliver more effective and efficient services, while at the same time opening the doors to a competitive advantage by forming a core element of their business strategy. Innovation is no longer just a survival factor for businesses, it has become the key to success. Therefore, the business world is shaping its future success by fully utilizing the opportunities provided by technological [11-14].

Innovation has an important role for organizations in terms of contributing to sustainability goals such as new technologies and processes, energy efficiency, environmentally friendly materials, and in terms of benefiting society. Innovations in areas such as health, energy and education increase the quality of life and improve the welfare of society.

3 Innovation Types

When we look at the definition of innovation from a broad perspective, we see that businesses focus on four main areas in order to gain and maintain a competitive advantage. These four main types of innovation cover various aspects of business and shape the development and growth strategies of organizations. These types of innovation help businesses not only improve their products or services, but also optimize their processes, rethink their marketing approach and reshape their organizational structure. Therefore, instead of focusing only on one specific type of innovation, businesses should take a broad perspective to explore and exploit the potential in these four areas. In this way, they can increase their competitiveness and achieve sustained growth. These are;

- Product/Service Innovation

- Process Innovation

- Marketing Innovation

- Organizational Innovation.

3.1 Product/Service Innovation

With the industrial revolution, the aim of maximizing the output has added the necessity for the product to be efficient to our lives. From this point of view, product innovation includes significant improvements in technical qualities, parts or materials, software, ease of use and other functional characteristics [15]. It is a well-known fact that product innovation, which is defined in the Oslo Guidelines as "the introduction of a new or significantly improved good or service according to its

existing characteristics or anticipated uses", is important for businesses to grow and sustain competition. Considering that the concept of innovation is included in all innovation definitions; it is possible to say that product innovations are included in the new product and new market. Following this process, the production of new products brings about the emergence of new professional groups.

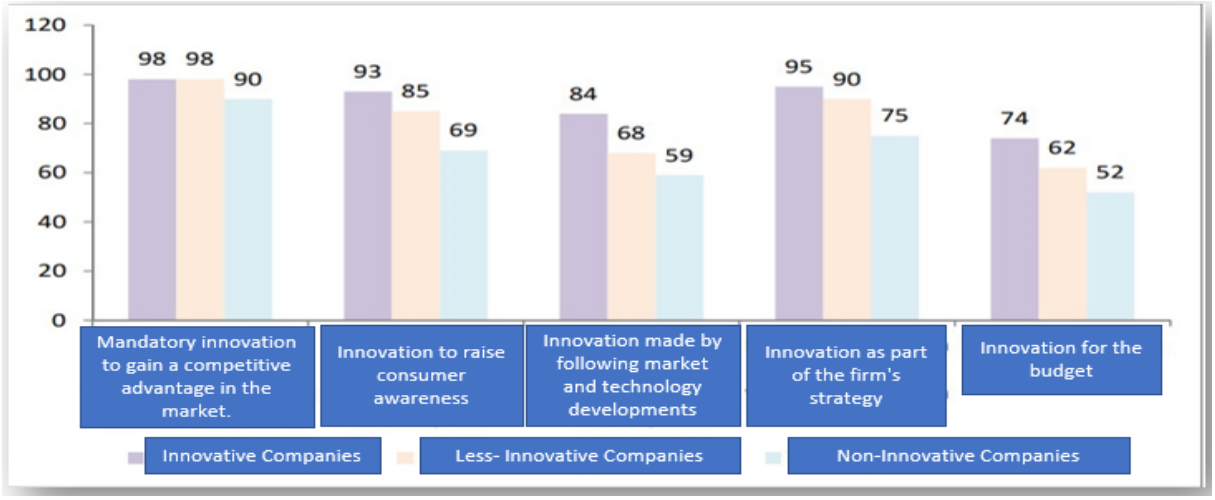

Figure 2: Characteristics of Innovative Firms

Source: Legenvre, 2008.

Product innovation provides companies with many advantages and plays an important role for a company's success. Therefore, it is important for companies to invest in product innovation, encourage innovative ideas and support their employees. However, it can also be seen in Figure-2 that innovative companies have a higher percentage of innovation than others, which they necessarily do in order to gain a competitive advantage in the market. In addition, taking customer feedback into account, conducting market research and establishing collaborations are also important steps that support product innovation.

Recent research clearly shows how digital technologies give rise to a vast potential for product and service innovation that is difficult to control and predict. Businesses therefore need dynamic tools to effectively manage new digital innovation processes and support their product and service portfolios. The nature of these processes leads businesses to question and revise their previous assumptions about how to organize product and service development, digital platforms and innovation efforts [16].

3.2 Process Innovation

Process innovation is defined as conscious organizational initiatives developed internally and carried out to improve production and service processes within the organization [17]. In short, process innovation is the innovations made to reorganize or improve the activities, processes or operations of a business. These innovations make businesses more efficient, effective and competitive. Process innovation helps businesses to reduce costs, increase quality, improve speed and flexibility, and increase customer satisfaction [18].

Product innovation plays a key role in business, which aims to meet the needs of consumers by developing new products or services and provides a competitive advantage. On the other hand, process innovation is a strategy for businesses to improve their production or business processes, increasing

efficiency and reducing costs. Both types of innovation offer businesses sustainable growth and a competitive advantage. Therefore, innovation is absolutely indispensable for businesses that want to succeed in the Business World [19].

Process innovation involves businesses analyzing their existing processes, identifying opportunities for improvement and using these opportunities to develop new and more effective processes. Process innovation covers business processes, supply chain, customer relationship management and production processes. One of the most important examples given for process innovation in the field of just-in-time production in quality is Toyota. Just-in-time production involves reducing inventories, optimizing the production process and supply chain, increasing quality control, flexibility and increasing the productivity of the workforce.

Process innovation involves the redesign and improvement of existing business processes, resulting in increased efficiency and faster execution of work. While ensuring the optimization of business processes in health institutions; it aims to minimize errors and even work with the principle of zero error. The best example of this situation is the reduction of waiting times with the digitalization of patient registration processes used in hospitals and access to medical record data through registration systems.

3.3 Marketing Innovation

According to the Oslo Guidelines, marketing innovation is defined as "a new marketing method involving significant changes in product design or packaging, product positioning, product promotion or pricing" [19]. Marketing innovation focuses on different ways of interacting with customers in the marketing process and involves finding a new method and can be related to any of the marketing activities [20]. Innovation in marketing methodology takes place in the form of identifying visible changes in the packaging or design of the product, pricing or incentivization of the product and implementing a new marketing method [21].

Marketing innovation plays a vital role in competitive differentiation and growth, especially for SMEs. For SMEs operating in uncertain and intensely competitive business environments, it represents an effective way to enhance their legitimacy, ensure sustainability and accelerate growth. These innovations can take place in different areas, such as overcoming traditional marketing strategies, expanding into new markets, using digital marketing techniques and improving the customer experience, so that businesses can build a closer relationship with their customers, increase loyalty and gain a competitive advantage [22].

3.4 Organizational Innovation

Organizational innovation refers to the development of new ways of working and doing business or the introduction of a method that has not been applied in the enterprise before [23]. Organizational innovation is based on innovative thinking and the creation of an innovative culture over time. The Oslo guide defines organizational innovation as "the application of a new organizational method in the commercial practices, workplace organization and external relations of enterprises" [18].

Organizational innovation requires the revision of existing business processes within the framework of a new understanding of work and innovation. This situation also affects the management approach; it becomes a necessity for businesses to change their shells within the framework of continuous development approach.

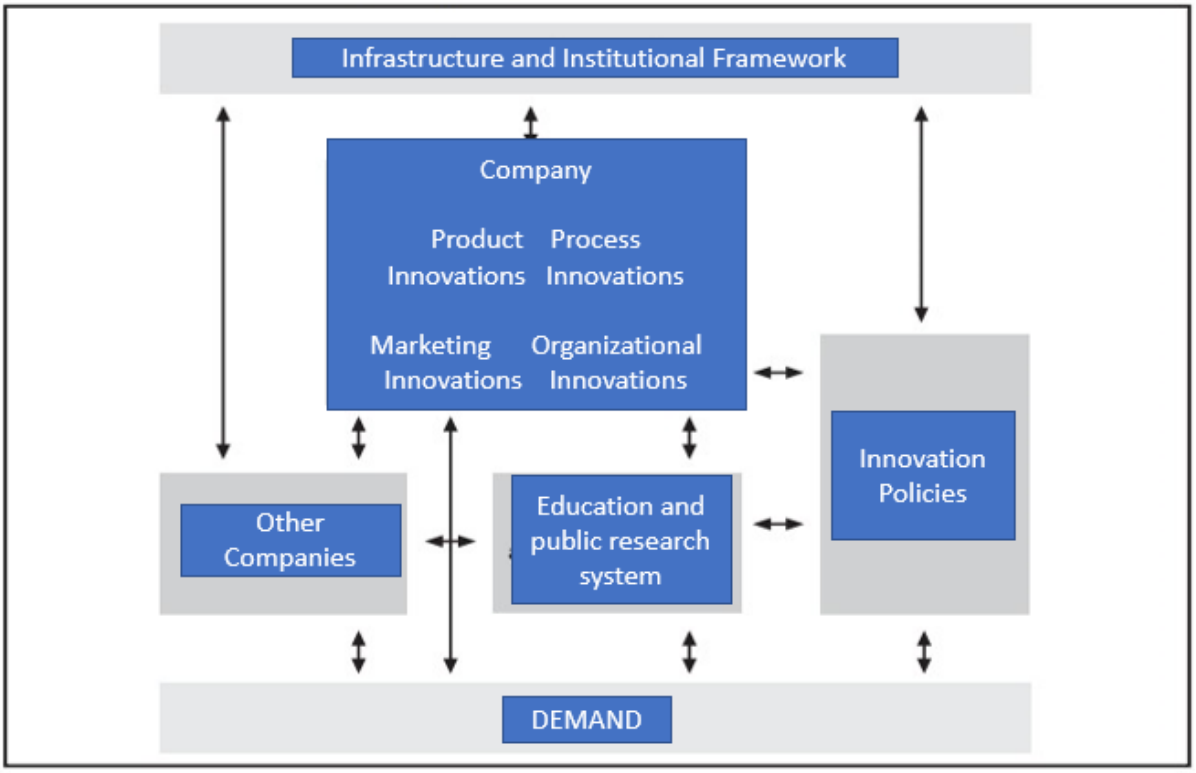

Figure 3: *Innovation Measurement Framework*

Source: https://www.tubitak.gov.tr/tubitak_content_files/BTYPD/kilavuzlar/Oslo_3_TR.pdf

Today, in a world dominated by global economic models, competitiveness has taken on an international dimension, leading business leaders to recognize the need for continuous innovation to thrive in a highly challenging environment. Innovation is the cornerstone for organizations to achieve sustainable growth and competitive advantage. In this context, the source of organizational innovation is certainly ideas generated by individuals and teams. These ideas are the cornerstones for developing new products, improving processes, enhancing customer experience and gaining a competitive advantage in the market. Innovation involves not only technological innovations, but also changes in organizational culture, management approaches and business processes. Therefore, leaders' encouragement of this creative potential, evaluation of ideas and adoption of innovation as a corporate strategy are key to success in today's competitive business World [24].

4 Product Innovation and its Possible Effects on Employment

Economic progress is largely driven by innovation. According to the Schumpeterian perspective put forward by Joseph Schumpeter, innovation is the basis for creative destruction, and new production methods, organizational management forms and products evolve leaving existing ones [25]. Therefore, the growth dynamics of an economy are based on creative destruction. This perspective links economic growth to innovation, in line with the work of Aghion and Howitt [26]. The neoclassical growth model assumes that an economy grows at its natural rate in the long run due to diminishing returns; however, the inclusion of innovation in this model weakens this assumption. Innovation therefore underpins economic growth dynamics and is central to employment growth in both the short and long run. Innovation increases the vitality of economies, creates new job opportunities and contributes to

improving social welfare. Encouraging and supporting innovation is therefore essential for the sustainable growth and development of modern economic systems [27].

Although classical economists emphasize that product innovation will lead to an increase in the labor force, the impact of new products on the emergence of new occupational groups has recently become a subject of debate. First of all, product innovation positively supports the labor force. Each newly developed product also leads to the creation of a new market and the emergence of new professions. The size of innovation, novelty, degree of substitution, demand for innovation, type of innovation, concreteness, uniformity of product and innovation, improved versus new product innovations are important criteria that determine the effects of product innovations on employment [28]. However, the substitute product can also be produced in a way that requires less labor, and this may have a negative impact on employment [29].

Product innovation in the manufacturing sector is an important factor with the potential to create jobs. Research helps us understand the effects of product innovation on employment. Studies by Dachs and Peters [30]. García et al. [31], Hall et al. [32]. and Harrison et al. [33]. indicate that product innovation can increase or decrease employment. In particular, the introduction of new products may increase employment, while old products may be replaced by new ones. Building on the work of Harrison et al. [33], Zhu et al. [34]. assess the effects of labor skill structure on technological change. Their findings suggest that the positive impact of process innovation can be mitigated by staff training and the negative impact of product innovation can be amplified by hiring skilled workers, especially if the skill structure of the labor force is oriented towards skilled workers. In other words, the employment of skill-intensive firms may be less responsive to innovation. Such insights emphasize the importance for businesses to consider workforce structure and capabilities when developing their innovation strategies and help us better understand the complexity of innovation on employment.

Katsoulacos (1984) conducted a detailed analysis in a general equilibrium setting to understand the impact of product innovation on employment. Unlike process innovation, product innovation is considered to lead to an increase in equilibrium employment levels. In order to explain this effect, two main factors called 'Welfare effect' and 'Displacement effect' are considered. Analyses using the recently developed 'Natural Oligapoly' model show that the most important factor determining the impact of product innovation on the level of employment is the 'Welfare effect'. That is, the introduction of new products and increased consumer welfare contribute to economic growth and indirectly positively affect employment levels. These findings provide an important perspective to business leaders and policy makers that promoting product innovation can not only contribute positively to economic growth but also to employment [35].

When a number of processes of product innovation that positively affect employment are examined;

- Product innovation requires the research and development of new products and provides new employment opportunities for specialists such as engineers, researchers, designers and programmers who will work in R&D departments. R&D and innovation are complementary concepts.

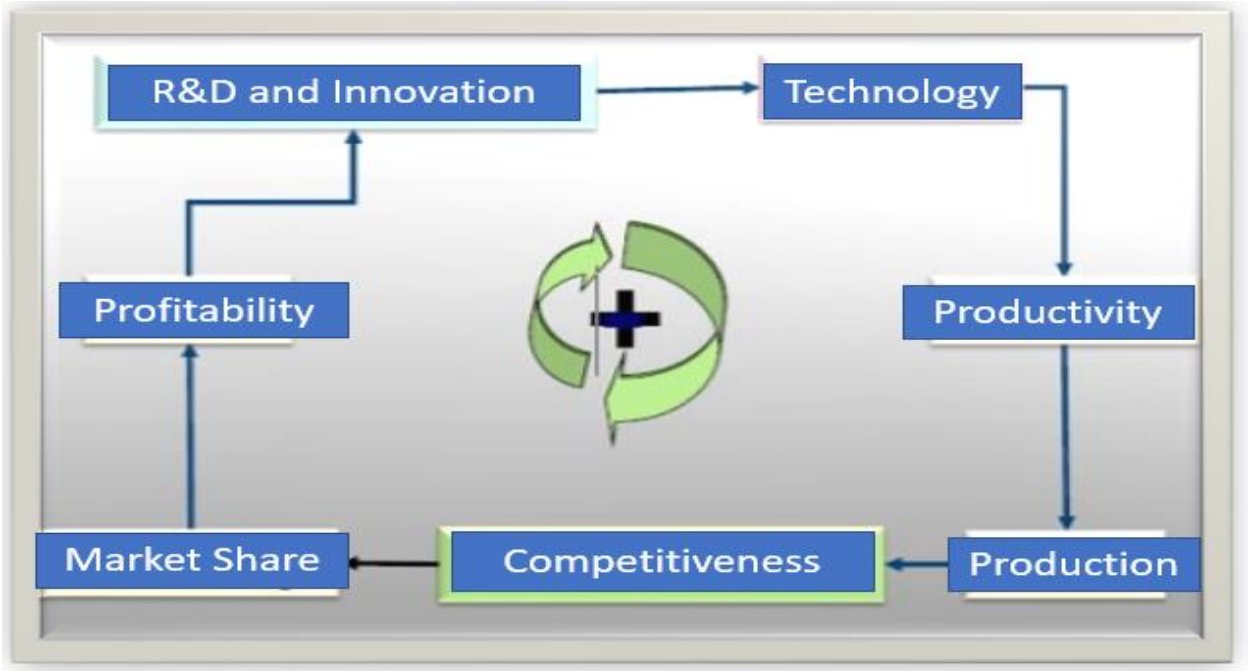

Figure 4: *Competition, R&D and Innovation Relationship*

Source : TÜBİTAK (2012); http://www.tubitak.gov.tr.

While R&D activities lead to the emergence of new ideas, innovation enables these ideas to be applied and commercialized. In terms of the health sector, R&D activities are behind the development of new treatment methods, new drugs, vaccines and surgical techniques. The development of new algorithms and techniques thanks to R&D studies also enables the introduction of artificial intelligence applications, and the patient diagnosis and treatment process is becoming more and more qualified every day.

- Product innovation does not only create employment opportunities for specialists such as engineers and researchers; it can also create employment opportunities for blue-collar workers and production personnel involved in the production and improvement of new products. In the innovative approach, which is thought to increase the employment opportunities of mostly white-collar workers, the possibility of employment opportunities for blue-collar labor in the production phase is also one of the issues discussed.
- In product innovation, the first thing that needs to be done for a newly launched product is to determine marketing and sales strategies. It is known that marketing requires expertise in itself. New employment opportunities may arise for skilled and experienced labor, and the expansion of sales teams means increased opportunities. In addition, new employment opportunities can be created for processes such as storage, distribution, etc. in the sales process.

The variety of products and services of healthcare organizations is increasing day by day. Artificial assisted diagnosis systems, mobile health applications, medical devices produced with 3D printing technology, remote health services are some of the product innovations in hospitals. While product innovation enables healthcare organizations to gain competitive advantage, it also necessitates investments in this direction. For example, medical devices used in healthcare institutions are constantly evolving and equipped with more advanced technology every day. The best example of medical device technologies is robotic surgery applications. Robotic surgical systems allow surgeons to perform more precise and controlled operations helps to do [36]. It provides employment opportunities for the

specialized workforce that develops and improves robotic surgery applications, which accelerate the healing process of patients and are safer and more precise at the same time.

5 Conclusion

In order for any innovation to be considered as innovation, it must be new for the business and offer an economic value [37]. Innovation practices in health systems are of great importance both in terms of providing new economic value and increasing the competitiveness of enterprises. In terms of the health sector, product innovation enables patient care to be realized in a better quality with advanced products; at the same time, it also increases the quality of life of patients. Thanks to new products and technologies, it is easier for physicians to make accurate diagnoses, and even remote diagnostic capabilities are being developed in the patient's home environment. Product innovation Although R&D studies may seem like a cost item for the relevant business during the production and launching of new products, they increase productivity and save costs over time.

Product innovation is considered to positively affect employment in terms of creating new job opportunities. It is possible to say that new labor force may be needed in the production, distribution and marketing stages of the newly developed medical device and new employment opportunities may arise for R&D departments and technical experts. Another important reality that innovation brings to our lives is that it constantly challenges employees in terms of training and development. Especially the continuous technologically-based development of the health sector requires employees to improve themselves and receive certain trainings. This may lead the workforce to increase their competencies and support employment in the sector.

The impact of innovation on employment in the health sector is not only positive; the replacement of traditional jobs by machines may also lead to unemployment. For this reason, both aspects of technology and innovation are discussed and it is generally argued that they will have different consequences in terms of qualified and unqualified labor force.

6 Declarations

6.1 Study Limitations

Since the study is written as a compilation, there are no limitations.

6.2 Acknowledgements

There is no person or institution contributing to this research other than the authors.

6.3 Funding source

No financial support was received for this research.

6.4 Competing Interests

There is no conflict of interest in this study.

6.5 Authors Contributions

Authors contributed equally to the article.

Harika ŞEN: Creating an idea for the article, taking responsibility for the literature review, and taking responsibility for creating the entire article.

Fatih ORHAN: Taking responsibility for creating the idea for the article and creating the main part of the article.

7 Human and Animal Related Study

Human/animal subjects were not used in the study.

7.1 Ethical Approval

Since the article was written as a review article, no ethical approval is required in our study within the framework of ethical rules and policies.

7.2 Informed Consent

Since this study was a review, informed consent was not required.

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