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Research Paper

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Presenting the basic and strategic innovation model in petrochemical design and construction companies

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Abstract

The purpose of this study was to provide a basic and strategic innovation model in petrochemical design and construction companies. The research method was mixed, and the statistical population in the qualitative part was 10 academic experts; and in the quantitative part 145 managers, assistants and senior experts of Petro Niro Saba Company. The sampling method was purposeful in the qualitative part, and simple random in the quantitative part. Delphi questionnaire (qualitative part) and researcher-made questionnaire (quantitative part) were used to collect data. The validity of the questionnaire was confirmed using Cronbach's alpha coefficient, convergent and divergent validity. In order to qualitatively analyze and validate the fundamental and strategic innovation model, the Delphi technique was used, and confirmatory factor analysis was used for quantitative validation. The results showed that the basic and strategic innovation model includes 7 components in the order of importance: the component of revolutionary technologies with a standard coefficient of 0.93 in the first place, the component of innovation in the market with a standard coefficient of 0.86 in the second place, the component of innovation in the development and planning of manpower with the standard coefficient of 0.85 is in the third place, the component of the birth of new industries with a standard coefficient of 0.83 is in the fourth place, the component of innovation in organizational processes and organizational structure is in the fifth place with a standard coefficient of 0.82, the component of product innovation with the standard coefficient of 78 0.75 is in the sixth rank, and finally the operational capability component with the standard coefficient of 0.75 in the seventh rank and 45 indicators.

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Extended Abstract

Introduction

By creating growth strategies, new classes of products; services and various business models change the game and create new values for customers and the company (Binai Bash et al, 2015). Since strategic innovation as a systematic concept is faced with the overall change of an organization's map, companies need to identify the extent of implementing strategic innovation in the organization and measure it, and find the dimensions of these changes and find components that can help them to implement strategic innovation in their organizations and companies (Chen et al, 2018).

Large organizations, including petrochemical designing and manufacturing companies, are facing political obstacles, internal conflicts, oil prices, geopolitics, and economic tension; fundamental and technological innovation is one of the needs of these large organizations. Non-aligned motivations, organizational structures that focus on existing operations, or personal motivations can affect innovation decision-making (Mirza et al, 2022). Executive managers also invest too much on their popular projects or spend a lot of resources on ideas that they have created themselves. Depending on the gradual or fundamental innovation, there might exist differences regarding how to be applied and which one is more important. So far, current research has not provided specific factors regarding the difference in criteria depending on innovation (Kranz, 2021).

Therefore, in this research, the researcher intends to answer the basic question that what the important factors of fundamental and strategic innovation in petrochemical design and construction companies are and how these factors are ranked.

Theoretical framework

Fundamental innovation is the creation of new products and services, which are generally technology-oriented. The vision of fundamental innovation is always moving ahead of time and the market. Usually, this model of innovation is technology-oriented, and in it, first the new production technology is defined, then its market is defined. Fundamental innovation changes the method and the realization of problems and the performance of phenomena in general. (Shahtahmasbi et al, 2017)

Strategic innovation is a clear goal of achieving competitive advantage by creating new customer and market value. However, this concept oscillates between two extremes; creating customer value in existing markets or for new markets. One of the key characteristics of strategic innovation is that it is stimulated in an organization where the creation of competitive advantage is rooted in its culture (Watson, 2022). Strategic innovation aims to re-conceptualize the business model, create a hassle-free market environment and jump in customer value. The learning process perspective of absorptive capacity (exploratory, homogeneous, changeable and exploitative learning processes) shows that the transformational learning process in particular plays a key role in strategic innovation (Carvalho et al, 2016).

Brink (2022) conducted a research entitled "Organizing to enable strategic innovation in the sense of horizontal leadership for the duality of stability and change". The statistical population is service companies in Paris. The research method was descriptive-analytical and purposeful sampling. The results of the research showed that while being creative and creating ideas seems very easy, being innovative and implementing these ideas and accomplishing them in a regular way is very difficult.

Baregheh et al, (2022) conducted a research entitled "The role of government and strategic innovation in organizational learning". The statistical population includes industrial companies in England. Research method is correlative, and sampling method is simple

random. The research results showed that the level of industrial governance and organizational strategic innovation can play an effective role in improving people's learning and organizational performance.

Methodology

This research is a descriptive-analytical approach that is applicable in terms of purpose, and based on the type of mixed data (qualitative and quantitative). The statistical population in the qualitative part was 10 university experts and in the quantitative part 145 managers, deputies and senior experts of Petro Niro Saba Company. The sampling method was purposeful in the qualitative part and simple random in the quantitative part. Delphi questionnaire (qualitative part) and researcher-made questionnaire (quantitative part) were used to collect data. The validity of the questionnaire was confirmed using Cronbach's alpha coefficient, convergent and divergent validity. In order to qualitatively analyze and validate the fundamental and strategic innovation model, the Delphi technique was used; and confirmatory factor analysis was used for quantitative validation. A researcher-made questionnaire was used to collect data related to fundamental and strategic innovation variables.

Discussion and Results

In order to qualitatively analyze and validate the fundamental and strategic innovation model, the Delphi technique was used, and confirmatory factor analysis was used for quantitative validation. The results showed that the basic and strategic innovation model includes 7 components in the order of importance: the component of revolutionary technologies with a standard coefficient of 0.93 in the first place, the component of innovation in the market with a standard coefficient of 0.86 in the second place, the component of innovation in the development and planning of manpower with The standard coefficient of 0.85 is in the third place, the component of the birth of new industries with a standard coefficient of 0.83 is in the fourth place, the component of innovation in organizational processes and organizational structure is in the fifth place with a standard coefficient of 0.82, the component of product innovation with the standard coefficient of 78 0.75 is in the sixth rank, and finally the operational capability component with standard coefficient of 0.75 in the seventh rank and 45 indicators**.**

Conclusion

The present research was conducted with the aim of providing a basic and strategic innovation model in petrochemical design and construction companies. The results of this research are consistent with the findings of researchers such as Baregheh et al, (2022), Hübel et al, (2022), Tayebi Abolhasani & et al, (2020) and Taherpour Kalantari & Hosseini (2020). Regarding the results obtained from this study, Tayebi Abolhasani et al, (2020) announced in their research that the capacity to absorb knowledge is effective on strategic innovation. Also, competitiveness and strategic flexibility play a moderating role in the relationship between knowledge absorption capacity and strategic innovation and increase the intensity of the relationship. From the perspective of Baregheh et al, (2022), the level of industrial governance and organizational strategic innovation can play an effective role in improving people's learning and organizational performance. Management systems with the support of ideation (through dispatchihg employees to exhibitions and conducting visits) and operational making ideas (through team building, establishing a system of proposals, and creating mechanisms of creativity and innovation) have an effect on technological innovation. The organizational structure shapes the activities of employees to achieve common organizational goals (Dinesh, 2021). By creating cooperation and respect in the organization, which provides

a cooperative and reliable environment between employees and managers, as well as increasing the willingness to take risks and the willingness to innovate among employees in the organization, the organization can be synchronized with technological innovations. Absence of any obstacle in intra-organizational communication, creating a cooperative environment in the organization, flexibility and readiness of employees to accept changes and pay attention to the ideas of new employees are more important in this dimension (Ghanbari, 2019).

According to the results of the research, it is suggested that the determination of the mission of the organization should be realistic, explicit, motivating, differentiating and meaningful, and be a response to the needs of the organization. It should also be clear and obvious enough so that all members of the organization can understand it. It is better to express the vision of the organization as quantitatively, clearly and objectively as possible so that its achievement is understandable for the members of the organization. In this regard, the value statement in the organization should be clear and the same for everyone and visible in the organization. It should be the basis for the growth of people in the organization and should be related and aligned with the organizational goals. Also, these values should be aligned with each other and synergistic.