Technological Capabilities as a Trend Toward Enhancing Technical Creativity - An Analytical Study at Zain Telecom Company in Iraq

[1]Mohammed Measr Hasan Jassim
PhD student
mohamedmaser02@gmail.com
(+249)994425897

[2]Dr. Mohammed Abdul Aati Abdullah
Al-Neelain University / Commerce College / Department of Business Administration

Abstract

The research aims to determine the impact of technological capabilities as a direction towards enhancing the technical creativity of a group of workers at Zain Telecom. The research problem revolves around that employing modern technological capabilities in business (technological capabilities) in Zain will add and develop technical creativity, and adopted a hypothetical scheme for the research in which objectives were defined. The research and its hypotheses. The researcher used the descriptive and analytical approach in order to reach the results, and the questionnaire form as a main tool in collecting information and data related to the field aspect of the research. Zain Iraq Telecom Company was selected in the field to research and test its hypotheses, and the opinions of (90) individuals were surveyed. Conclusions are among the most important (in order to reach an integrated and effective production system, modern technological capabilities that are concerned with all the organization's operations should be used, and for this purpose the term technological capabilities is used), and then formulating a number of recommendations related to the results of the research, the most important of which is (increase The interest of the company's management under discussion in the types of technical innovation being one of the basic tools that help it in introducing new products and improving existing ones, As well as designing new operations and improving existing ones in order to be able to adapt to the outputs of technological development and the conditions of sharp competition in the markets).

Keywords: communication capabilities, research and development capabilities, network capabilities, technical innovation.

Introduction

Companies, especially telecommunications companies operating in Iraq, face many challenges in light of the current competitive environment and complex economic variables, which has led to their need more and more to upgrade their products and occupy a competitive position in the local market, especially with the expansion of the range of markets and the change of their borders with the entry of foreign companies, and the intensity of competition has doubled. And it took a variety of forms, through which companies compete to gain the

most available and possible advantages in order to preserve their market position and enhance their competitiveness. Therefore, it is necessary to search for modern methods necessary to develop business mechanisms in Iraqi telecommunications companies that are carried out by these companies and to search for designing processes that keep pace with these changes in the market, work to improve the products provided by Iraqi telecommunications companies and try to design new products in line with the technological developments followed in Foreign companies.

In light of these data, the intellectual framework for this research is centered by determining the impact of technological capabilities as an orientation towards enhancing technical innovation, and Zain Telecom Company chose a field to diagnose these principles, and used these parts in a logical and practical context to be a model and a starting point for surveying the opinions of employees in executive departments And the operational ones that represent the basis of the company's operations.

The first topic: Research methodology

First: - The research problem

The communication companies operating in Iraq exist to provide communication services to customers, and in order to remain and grow in the external environment, which is witnessing intense competition between companies, they must find the necessary capabilities and skills that enable them to introduce new products and improve existing products to meet or exceed customers' requirements. The types of technical innovation are considered one of the main sources of competitive advantage, because they give the company something unique that other competing companies miss, such as the uniqueness that distinguishes the company from its competitors in terms of cost, quality, flexibility or delivery, and this means for the company to be able to survive and grow in competition markets it must create capabilities And the skills necessary to enable it to provide all that is new or improved from the products in order to achieve that advantage over the competitors.

Through the foregoing, the research problem is crystallized in identifying the impact of technological capabilities as a direction towards enhancing the technical innovation of Zain Iraq for Communications, the research sample. Therefore, asking the following questions can contribute to clarifying the implications of the research problem:

1. What are the technological capabilities prevailing in the company? Is there any difference in the interest of the company in question in terms of its adoption of all technological capabilities?
2. What is the importance of technical creativity? Does the interest of the company in question differ in terms of its adoption of all kinds of technical innovation?
3. Is there a significant correlation between technological capabilities and technical creativity?
4. Do all technological capabilities influence the enhancement of technical creativity?

Second: - The importance of research

The research derives its importance from the importance of the topic it addresses and the chosen site for the research, as this research contributes and by proposing the theoretical

frameworks for the research variables represented by technological capabilities and technical creativity, and the importance can be determined to two levels:

1. **Academic level:** The academic importance of the research topic is reflected in the academic importance of building a frame of knowledge for topics (technological capabilities, technical creativity), as well as enriching and enriching the Iraqi library due to the limitations of studies related to research variables. Therefore, the researcher seeks to present an intellectual framework that is a point. The beginning for other researchers to enrich this topic. And the importance of technological capabilities as a modern trend that seeks to enhance technical innovation in technical operations.
2. **Field level:** the field importance of the research topic is reflected: determining the technological capabilities of the company in question. The study of the independent variable (technological capabilities) and its impact leads to the possibility of determining the required level of support for these variables that positively affect the dependent variable (technical innovation) of the communication company in question. This research is important at the field level, as it will provide an information base that can be employed in the company in question. This information will guide how to employ the technological capabilities that support the enhancement of technical innovation to add new capabilities in the company's technological capacity.

Third: - Research objectives

In light of the current research problem and the lack of studies linking the variables under investigation (technological capabilities, technical creativity), the main research goal is to determine the impact of technological capabilities as a direction in promoting technical innovation in Zain Telecom. The main objective is divided into two sub-goals:

1. Establishing a diagnostic framework for the technological capabilities in the field of Zain Telecommunications Company, and the related capabilities that enhance the company's competitive position.
2. The research aims to introduce Zain to what the technological capabilities are, and what types of technical creativity are to be promoted in the company.
3. Enhancing the perceptions of the company under discussion regarding the general content of the assumptions from which the research was launched and presenting this relationship with a hypothetical model aimed at field application to reach the results of hypothesis testing.
4. Presenting a practical view of the nature of the impact of technological capabilities as an approach in enhancing technical creativity, and knowing the extent of the variation of the company under consideration in adopting the research variables.
5. A report on the perceptions of the functional community in the company regarding the general content of the assumptions from which the research was launched in the field of technological capabilities and their impact on supporting the trend towards enhancing the technical creativity of the company under consideration.

Fourth: - The research form

The systematic treatment of the research problem according to its theoretical framework and field contents requires building a hypothetical scheme that reflects the nature of the logical relationship between the variables under consideration (technological capabilities, technical creativity), as well as clarifying the sub-variables of those variables and their effects on the communication company under consideration, taking into account the possibility of measuring these variables. Assuming that the relationship is one-way.

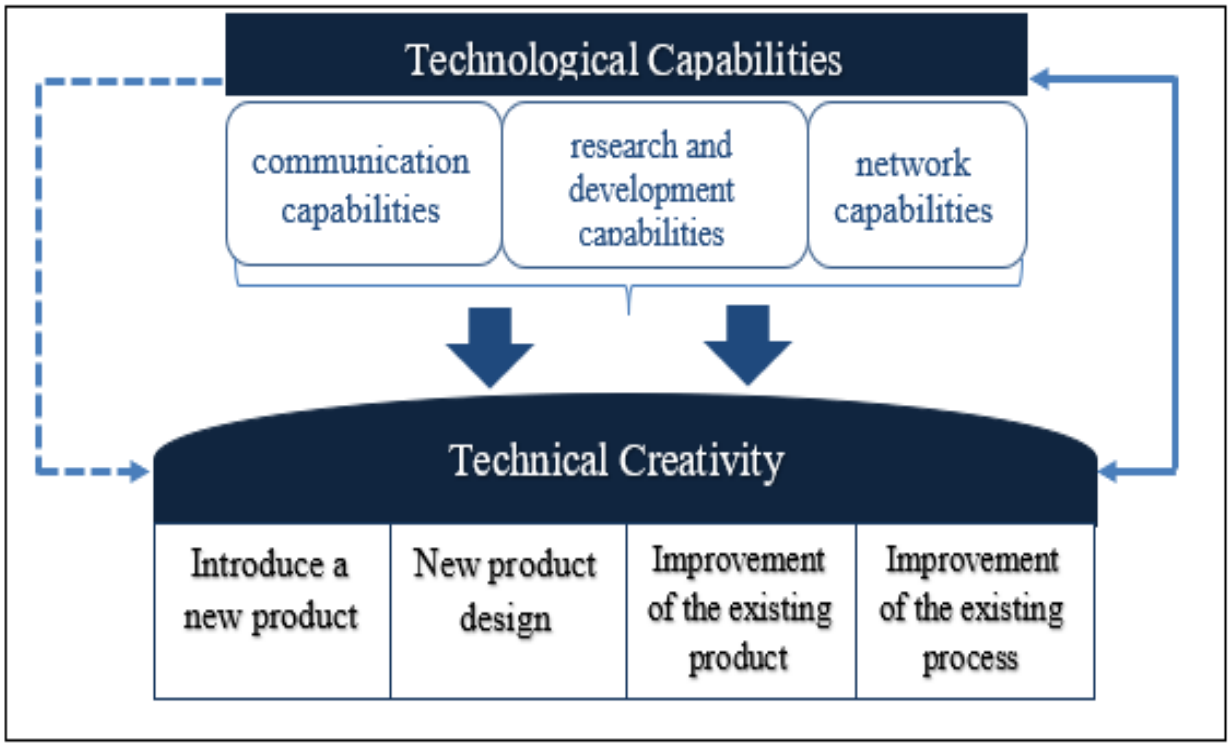

Figure (1) the search form
Source: Prepared by the researcher

Fifth: Research hypotheses

- **The first hypothesis:** The interest of the company in question varies significantly in terms of its reliance on technological capabilities.
- **The second hypothesis:** The combined interest of the company under discussion in the types of technical innovation varies significantly.
- **The third hypothesis:** There is a significant correlation between technological capabilities and technical creativity in the company under study.
- **The fourth hypothesis:** All technological capabilities have a significant effect on enhancing technical creativity in the company under consideration.

Sixth: Research borders

The current research includes some limitations, namely:

- **Human borders:** It includes the (90) workers in the operational and executive departments of Zain Telecom.
- **Spatial borders:** The spatial search limits of the scope of the search included (Zain Telecom) as a field of study.

- **Temporal borders:** It is represented by the period of preparation of the research in Zain Telecommunications Company, which began with field visits and interviews that contributed to diagnosing the research problem, and then collecting initial information about the research community, and the period of distribution and retrieval of the questionnaire, and extended for the period 1/15/2020 until 10 / 10/2020.
- **Research borders:** They are represented by the cognitive limits of the exploited variable (technological capabilities) and the significant variable (technical creativity).

Seventh: Research tools

In order to achieve the objectives of the research and test their hypotheses, two types of data collection methods were adopted by:

1. The first type related to covering the theoretical side through many sources represented by scientific references such as books, journals, studies, theses and periodicals, available in libraries, as well as relying on the International Communication Network (the Internet).
2. As for the second type of data, it was obtained through analytical research, and through a questionnaire form, and it is the main tool in collecting data and information for the research whose formulation took into account its ability to diagnose and measure the main variables. (Technological capabilities, technical creativity) And sub-search, and included the questionnaire in its final form and after making amendments to its initial form.

The second topic: the theoretical framework of the research

First: technological capabilities

1. The concept of technological capabilities

Technology has been described as "the systematic application of scientific knowledge and other structured knowledge to practical tasks", technological capabilities are the information and technical, managerial and institutional skills that allow companies to use equipment and technology efficiently (Lestari & Ardianti, 2019: 49). These capabilities are a form of institutional knowledge that is made up of the common skills accumulated by its members over time (Nurazwa, 2014: 397).

Technological capacity development should not be viewed as the ability to undertake pioneering innovations, although innovative capabilities are an important component of technological capabilities Technological capabilities encompass a much wider range of effort that each organization must undertake in order to assimilate the knowledge that must be used. In production and build on. This includes purchasing some skills and information from the market and introducing others internally, and choosing based on technology, market conditions and company strategies (Rasiah & Malakolunthu, 2019: 184).

He defined (Rasiah, 2018: 168) technological capabilities as a set of technological elements that the company possesses that enable it to achieve competitive advantage and enhance its performance levels. He defined it (Bergek, 2018: 339) technological capabilities as the ability to mobilize and deploy information technology based on resources based on other capabilities. The combined availability of the perspectives is an answer to three questions that can form the basis for the evaluation of technological capabilities and the comparison between them, represented as follows: (Bell and K. Pavitt, 2012: 258).

- What is the impact of technology on the organization's ability to serve its customers?
- How does the proposed technology help build operations resource capacity?
- What are the determinants, returns and benefits based on the size of the financial investment in technology?

Information represents a good investment in technological means and equipment capable of providing information that gives companies the advantage of keeping pace with the various changes and developments towards achieving a competitive advantage and effective and distinct performance, and that the process of renewal in information technology capabilities is one of the difficult and complex matters for business organizations because of the rapid developments in technology that need Skills and high training for the staff who are responsible for it (Aw & Batra, 2018: 63).

Technological capacity refers to the ability of a company to deploy, develop and use technological resources and integrate them with other complementary resources to provide superior products and services.

2. The importance of technological capabilities

The technological capabilities are more than the sum of the education and training of the company's employees, and it includes learning about the technological methods that individuals undergo while working in the company and the way in which the company collects, and motivates individuals to work as a company, so any company trying to use a new technology acquires some capabilities as a result. Automation of the production process, this learning goes to some extent in developing the necessary capabilities (Costa & Queiroz, 2012: 1437).

The importance of technological capabilities for business managers lies through maximizing the good use of resources by business managers through the role of information technology capabilities. And the role of strategic planning for long-term work and its importance in the company's continuity. And interaction and work with different processes in the work environment, which gives the company strength and competitive advantage (Kumar & Persaud, 2019: 85).

Technological capabilities represent the tools and equipment that companies use to obtain information, analyze it, and present it in a family and more efficient way, as all operations and tasks in business companies depend mainly on modern technology and the technologies it provides capable of facilitating jobs, and they provide specialized information for all areas Work and sectors, and help in taking good decisions in a timely manner, which is reflected in the performance of workers and the goals that are to be achieved (Oyebisi et al, 2014: 427).

Technological capabilities represent good investment in technological means and equipment capable of providing information that helps business organizations to keep pace with various changes and developments towards achieving competitive advantage and effective and distinct performance, and that the process of renewal in information technology capabilities is considered one of the difficult and complex matters for business organizations due to the rapid development of technology. It needs skills and high training for the employees who are based on it (K.-H. Tsai, 2014: 188).

3. Technological capabilities objectives

The technological capabilities objectives are as follows: (Coombs & Bierly, 2016: 428) (Wang et al, 2016:31)

A- A comparison between alternative technologies or changes to the technology itself, then choosing the type of technology that will be adopted in providing the service, and determining the degree of automation and the volume of investment in it.

B- Diagnosing how technology improves the effectiveness of operations, and managing a certain process in a way that does not conflict with the current activities of the operations, and contributes to upgrading it and replacing it when necessary, while determining the benefits of its use in the processes, and the determinants that obstruct their achievement.

C- Determining the advanced technology that will be invested in as part of the company's overall strategy.

D- A clear understanding of the various programs used to perform the different jobs.

E- Analyzing and representing data to facilitate its use in decision-making processes.

F- Integration and coordination between the various operations to provide products and services that suit the needs of customers.

G- Realizing new value and a competitive advantage for the company.

4. Dimensions of technological capabilities

The main technological capabilities dimensions include the following:

• **Research and development capabilities:** the organization's ability to manage and acquire information technology, as well as the ability to analyze and publish it by individuals working in it to increase its competitiveness (Garcia-Muina & Navas, 2017: 37). It is the ability of cellular telecommunications companies to analyze, develop and spread information technology, by encouraging methods of technological research, and following up on contemporary developments in technology, through the presence of technicians and skilled specialists in the research and development department (Jin & von, 2018: 330). The capabilities of research and development are represented by what the organization possesses in terms of technology and technical skills in the field of technological research, which provides knowledge and information in the areas of its specialization (Rasiah, 2018: 169). When the company builds its technological capabilities, it invests significant resources in research and development, which includes discovery of a new product, accumulation of stock of knowledge, and training of technical personnel (Wang et al, 2016:34). He (Oyebisi et al, 2014: 429) indicated that research is a basic means by which to reach a solution to a problem through fact-finding and the phenomena assigned to it. (Coombs & Bierly, 2016: 429) defined development as the application of knowledge to produce or develop products, or methods that include designing basic molds for products, or making required improvements.

• **Communication capabilities:** is the ability of the organization to operate wired and wireless communication networks in accordance with its computer systems in order to support its operations and business (Garcia-Muina & Navas, 2017: 39). It is the ability of cellular telecommunications companies to use the best methods and modern technological means in operating their wired and wireless communication networks, through the technological infrastructure available in these companies, in line with the computer systems used for them in

order to support their operations (Lestari & Ardianti, 2019: 50). The idea of cellular networks arose within the framework of efforts to develop a mobile wireless communication system, where the basic principle of cellular networks is the use of fixed radio stations with low power, in a way that allows the reuse of radio channels by other stations that are not far apart, where the range of broadcasting and their number are chosen. According to the design needs, each station is designed to provide communication service in a specific geographical area (Rasiah & Malakolunthu, 2019: 184).

• **Network capabilities:** is the ability of the organization to connect between the constituent parts of its organizational units, represented by lines connecting the departments and divisions of the organization (Kumar & Persaud, 2019: 88). It is the ability of cellular telecommunications companies to connect the component parts of their units to each other, represented by lines or channels that connect the company's management and divisions to each other (K.-H. Tsai, 2014: 189). In many organizations that use technology to manage their business, as well as in the process of communication between their units and departments, they use their own network or the so-called intranet, which is considered a company's computer network in which the protocols used in the Internet are used, and this in turn works to empower workers in the organization From communication among themselves, and access to information at a high speed (Bergek, 2018: 342).

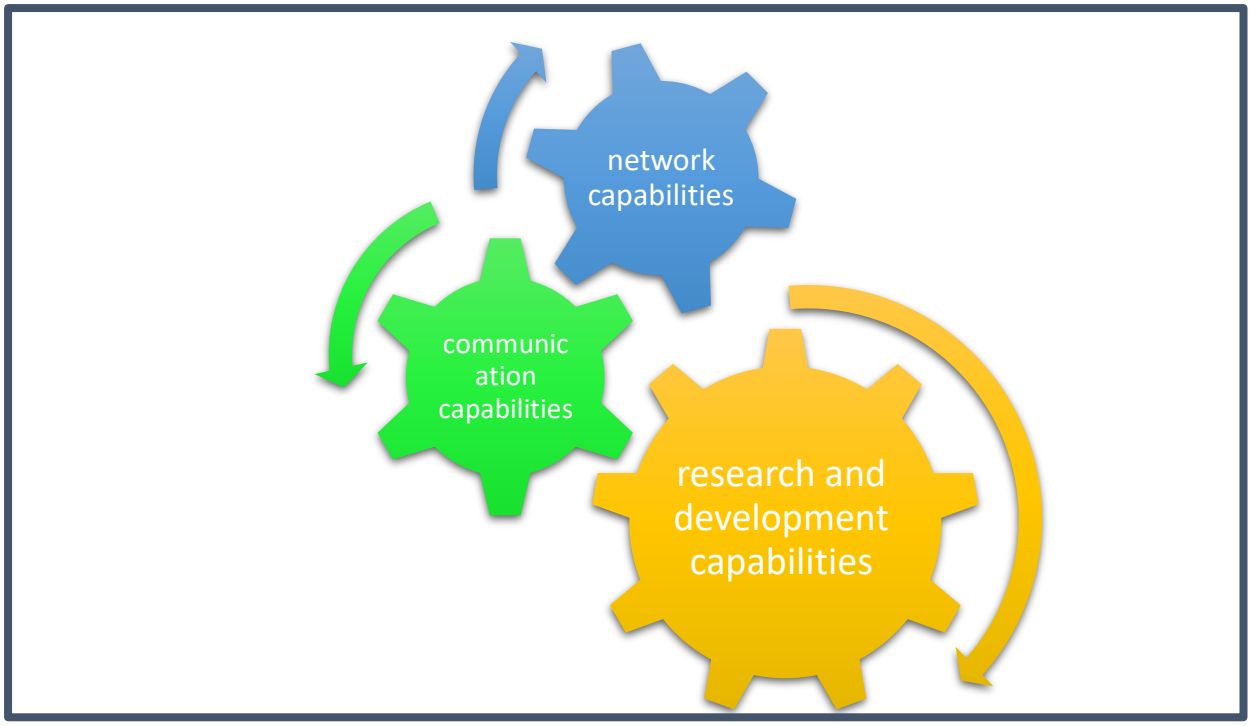

Figure (2) the dimensions of technological capabilities
Source: Prepared by the researcher

Second: technical creativity

1. The concept of technical innovation

Creativity is what results from original, distinctive and beneficial creative thinking that helps in administrative, social or technological development, and contributes to solving a problem in an innovative or distinctive way, relying on the originality of thinking in examining

the largest possible number of available hypotheses and choosing the best and most appropriate for the administrative, social, or technological reality and jealousy (Laurentiu et al, 2016: 575). The word creativity is often used to denote everything new and unique, in addition to that it includes brilliant and bright ideas and wonderful arts, and what must be pointed out is that creativity is not a gift given to a select few individuals, as each individual is born with a tremendous creative energy (Belous, 2014: 22).

The technological innovation system can be represented as a system open to the technical (science and technology), social, cultural, economic, and political environment, feeding from its various resources in order to transform them (resources and information) into innovations in the form of improved or new products or methods (Ambrose, 2017: 349).

Technological innovation is defined as the set of activities or functions designed to transform the idea of a product or method of production, until its realization and embodiment in a tangible form (Belous, 2016: 332). He asserts (Livingston, 2010: 60) that technical innovation is the discovery and development of products (goods or services) or processes. The discovery and development of new products is the gateway to developing new knowledge and translating it into commercial applications. He asserts (Nagîţ, 2011: 82) that technical innovation is the result of the application of recognized technical knowledge or technology, and this means that everything new is based on inaccurate information and thus leads to ineffective results that cannot be considered technical innovation.

Based on the foregoing, we see that technical innovation is the process by which the company can achieve coordination and cooperation between the company's activities such as production, marketing, research and development with the aim of adopting new ideas and methods and translating them in the field of work into a new product (a new good or a new service) or developing an existing product (Existing product) or using a new production process or developing an existing production process to meet customer requirements for products, as well as making the company the best in the competition market.

2. The importance of technical creativity

Talking about the management and development of creativity has become a familiar matter among writers, researchers and managers circles, and it represents one of the axes of interest of managers in many companies, and studies in the field of technical innovation agree on its importance to the company and to the industry as a whole with its many advantages. Due to their changing needs and desires over time, the areas of technical innovation represented in introducing a new product, developing an existing product, introducing a new process or developing an existing process have become within the paragraphs of the various measures that are used to evaluate companies' performance (Danah et al, 2018: 311).

The importance of technical innovation is demonstrated by achieving the following benefits: (Cachia, 2010: 51)

- Improving quality by reducing the percentage of spoilage, exhaust, defective and rejected.
- Increasing the company's ability to compete with companies through speed in introducing a new product and changing production processes, reducing manufacturing costs and capital through innovation in the process.
- Enhancing and activating the performance of the company in general.

- Improving the company's image and making its position acceptable to customers.
- Ease of influencing customer tastes due to the diversity of media programs.

3. Characteristics of technical creativity

Characteristics of technical creativity include the following: (Feldman & Benjamin, 2016: 322) (Csikszentmihalyi & Wolfe, 2014: 163)

- Technical innovation is the result of applying recognized technical or technological knowledge, meaning that everything new is based on inaccurate information and thus leads to positive results.
- That creativity is related to production and productivity, meaning that every creativity does not lead to improving the production process or using the elements of production, nor even in providing new products or improving existing products, is not considered a technological innovation in the correct sense.
- Technological innovation without its spread in the markets is limited in effectiveness and efficiency according to the schlumped view. Technological innovation is a fundamental factor in competition and thus in the dynamism of the free market, and for comprehensive economic development to be achieved, it must have wider effects.
- The creative efforts that lead to lack of control over costs are not technological innovations, and the main point here is that technological innovation carries with it the competition in the final cost.

4. Types of technical creativity

Types of technical creativity include the following:

• **Introducing a new product:** New products are goods and services that are fundamentally different from those that are originally marketed by the company. He explains (Malhotra & Bana, 2015: 71) that the new product is the one that enters the market for the first time and may not be new in the market, but rather new for the company that provides a new benefit to the customers, and indicates (Mishra & Deep-Play, 2012: 18) A that the new product is everything that is presented to the market to attract attention or for consumption or satisfy a demand or need that does not include the tangible product only, but is everything that meets the customers' desires and satisfies their needs. It shows (Mishra & Henriksen, 2018: 411) that a new product is anything that can be changed, added, improved, or developed according to the specifications and characteristics of the product, whether tangible or intangible, or the services accompanying it, and leads to the satisfaction of the needs and desires of current or potential customers. In targeted market sectors, and this product is new to the company, market, or customers. He asserts (Laurentiu et al, 2016: 578) that introducing a new product is crucial to the survival of many companies. At a time when there are few companies that try or change their products, most companies review their products, and in rapidly changing industries, introducing a new product is a way. for life. In light of the foregoing, it can be said that introducing a new product is the process of finding ideas to present a new product that is presented for the first time and is new to the company, the market and customers, and it may be new to the company, but it is not new to the markets.

• **Improving an existing product (the current product):** The product improvement process provides the company with the opportunity to conduct studies related to reducing the cost of producing the product, achieving distinctive quality, and developing the ability to serve customers. (Belous, 2014: 21) confirms that an enhanced product is a product that has been modified or improved to meet the needs of the customer, such as using color television as a development of regular television. It shows (Belous, 2016: 334). that improving the current product is a decision taken by the top management of the company. However, the information required to make and perform the improvement may originate from the customer. As for the implementation of the decision to improve the current product, it requires coordination of efforts among a number of Competences in the company. (Livingston, 2010: 63) confirms the improvement and development of existing products that helps the company to survive and continue to conduct its business in an environment characterized by intense competition and also helps the company achieve its strategic goals related to survival and growth. In his opinion (Danah et al, 2018: 317) that many cases have shown that the improvements in the product development process have achieved a significant reduction in production costs, ranging between (25% -40%) in addition to Reducing the time of product development by more than (5%) and improving its quality significantly. (Ambrose, 2017: 350) believes that improving and developing the product means the process of creating concepts, designs and programs for the products that the company wants to present to the market, and one of the challenges that the industrial company faces is developing the product that achieves customer satisfaction in terms of quantity. And the quality and on competitive basis, such as cost, speed and effectiveness of supplying to customers on time. He explains (Nagîţ, 2011: 84) that it is taken for granted that planning and developing new products is vital to the success of any business. In light of the foregoing, it can be said that improving the current product is intended to modify and improve it in order to present it to the market in a new way to meet the needs and desires of customers.

• **Designing a new production process:** The process design shows how the product is made. He defined (Cachia, 2010: 55) process design as the task of selecting and arranging the equipment required for the conversion process and the integration of the workforce and other resources with the equipment. He (Csikszentmihalyi & Wolfe, 2014: 164) pointed out that designing the process at the strategy level means designing the network of operations through which the customer obtains the products, and also at the process level, it means organizing physical facilities for operations, technology and personnel for operations. He explains (Feldman & Benjamin, 2016: 328) that the aim of the process design is to determine how to organize the company's material resources in order to achieve the best benefit for it. Based on the foregoing, it can be said that designing a new production process requires determining all the requirements for making the new product, such as preparing and preparing the inputs and what is required for conversion processes in order to become finished products according to the requirements of customers.

• **Improving an existing (existing) production process:** process improvement means systematic study of the activities and flow of each process with the aim of improving it. He (Cachia, 2010: 53) stated that process improvement aims to achieve a continuous high level of quality in process performance. He explained (Csikszentmihalyi & Wolfe, 2014: 166) that process improvement refers to the activities, methods, practices, and tools that should be used

in order to produce a specific product, and requires completion of the following improvement: (Understanding the current situation of process development, and developing a clear future vision for the process. Required, develop a list of activities to be implemented to improve the process, provide the necessary resources to implement the plan, and control implementation). In light of the above, we see that improving an existing production process requires a systematic study of activities, procedures, methods, practices, and tools to perform the process better than it was before.

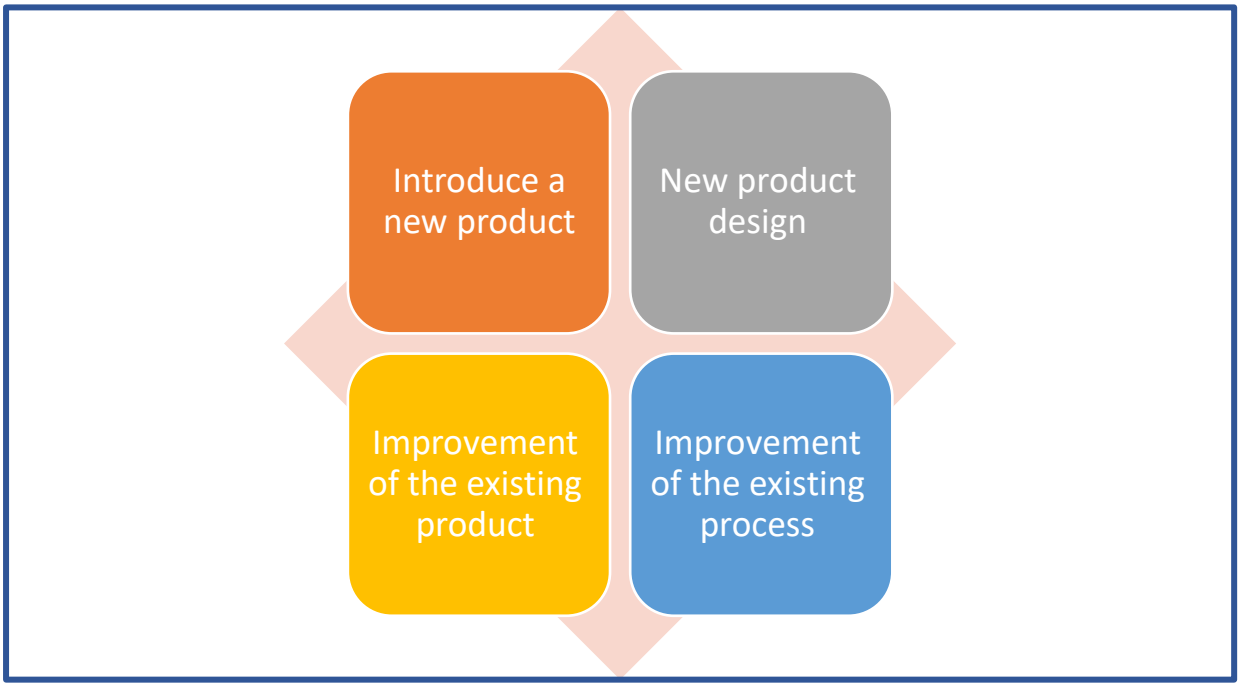

Figure (3) the Types of technical creativity
Source: Prepared by the researcher

Third: The relationship between research variables

Communication companies today seek to consolidate their reputation and competition by providing distinguished services. These companies provide those services through technological capabilities represented by research and development capabilities, communication capabilities and networks, and thus technical innovation processes can be strengthened Costa & Queiroz, 2012: 1439). The pursuit of communication companies towards success needs them to improve and develop their capabilities to meet the needs of their customers, and this requires distinct and trained human resources, and it also requires a modern technological infrastructure, and among the capabilities that companies seek to develop are technological capabilities, which are the activities that provide Firms choose the right technology and use it to achieve their competitive advantage (Lestari & Ardianti, 2019: 52).

In order for telecommunications companies to be able to follow the stages of work, they use modern technology in order to control the stages of work and thus control the timing, cost and quality of services, and among these capabilities are communication capabilities, networks, research and development, through which companies can enhance their technical creativity and provide new services and develop the current (Garcia-Muina & Nava's, 2017: 39). Technological capabilities are the knowledge and skills that must be provided in

telecommunications companies to select, use and develop technology and find appropriate technological solutions to achieve their competitive advantage and reach cases of technical innovation (Bell and K. Pavitt, 2012: 260).

The third topic: the field framework for research

First: Description of the field of research:

1. Brief introduction About the company Zain:

Zain Iraq is one of the Zain Group companies, the leader in telecommunications and mobile data services in the Middle East and North Africa region. The awareness of the brand reaches 97% of the total population of Iraq, as the company adopts its strategy around understanding the consumer's desire and making it the focus of any service or idea it proposes in the market And Zain Iraq is keen to provide the best and most advanced services so that the subscriber achieves what he aspires to, wherever he is. Thus, the subscribers are the most important driver behind the success of the company, and distinguished service standards remain the main engine for introducing the latest technologies in the communications and information sector.

2. Determine the size of the sample:

It is not sufficient for the researcher to choose the appropriate sample to be used in the study, but rather it is important to determine the size of the sample to be studied, which can represent the community as a whole, and determining the sample size is associated with the accuracy sought from the sample to be studied, which represents the community as a representation (Abdullah, 2014: 35). The individuals were selected from the managers and officials of the departments and divisions in the company in question (Zain Company), and the two researchers distributed (90) questionnaires to the individuals surveyed.

Second: Description and diagnosis of research variables:

1. Describe and diagnose technological capabilities

The overall agreement rate for technological capabilities was (80.6%), meaning that the individuals surveyed whose opinions in the company under investigation confirmed that the company possesses technological capabilities in terms of its dimensions. As for the individuals interviewed, their opinions whose answers were in the negative direction represented (6.5%), and formed the percentage of the respondents whose opinions did not have an opinion or their answer was neutral is (13.1%). The preliminary analysis of the answers of the respondents confirms their opinions that the company possesses the technological capabilities, and all the tools came with an arithmetic mean of (4.01), a standard deviation (0.86) and a coefficient of variation. (0.214).

The significance of the description of technological capabilities can be arranged in terms of degree of agreement.

A. What contributed to the positivity of this variable is the capabilities of research and development, as it came with an agreement of (81.3%), meaning the dimension came first.
B. Communication capabilities came in second place, with an agreement of (80.6%).

C. Networks capabilities came in third place, with an agreement of (79.3%).

Table (1) Summary of Technological Capabilities

technological capabilities	Totally agree, agree	neutral	Do not agree, do not completely agree	Arithmetic mean	standard deviation	Coefficient of variation
communication capabilities	80.6	14.3	5.3	4.02	0.88	0.218
Research and development capabilities	81.3	11.6	7.4	3.98	0.89	0.223
network capabilities	79.3	13.5	6.7	4.01	0.81	0.201
General Average	80.4	13.1	6.5	4.01	0.86	0.214

Source: Prepared by the researcher based on the statistical program (SPSS). N = 90

2. Describe and diagnose the types of technical creativity

The overall agreement rate for the types of technical innovation was (78.4%), meaning that the individuals interviewed had their opinions in the company under investigation emphasized that the company uses technical innovation in terms of its aforementioned types, while the opinions of the respondents whose opinions were in the negative direction represented (6.2%) The percentage of the respondents formed their opinions who did not have an opinion or their answer was neutral (15.4%), and the preliminary analysis of the answers of the individuals interviewed confirms their opinions that the company owns the types of technical innovation, and all the elements came with an arithmetic mean of (4.00) and a standard deviation (0.85) The coefficient of variation (0.215). The importance can be arranged to describe the types of technical creativity represented by its types and diagnose them in terms of the degree of agreement.

A- What contributed to the positivity of this variable was the improvement of an existing product, as it came with an agreement of (81.1%), meaning that the dimension came first.

B- Improvement in an existing process came in second place, with an agreement of (79.3%).

C- The introduction of a new product came in third place, with an agreement of (78.3%).

D- The design of an existing product ranked fourth, with the degree of agreement (76.5%).

Table (2) Summary of types of technical creativity

types of technical creativity	Totally agree, agree	Neutral	Do not agree, do not completely agree	Arithmetic mean	standard deviation	Coefficient of variation
Introduce a new product	**78.3**	**15.4**	**6.4**	**3.94**	**0.87**	**0.224**
New product design	**76.5**	**18.7**	**5.1**	**4.02**	**0.88**	**0.222**
Improvement of the existing product	**81.1**	**12.5**	**5.4**	**4.03**	**0.82**	**0.197**
Improvement of the existing process	**79.3**	**14.5**	**6.3**	**4.01**	**0.87**	**0.217**
General Average	**78.4**	**15.4**	**6.2**	**4.00**	**0.85**	**0.215**

Source: Prepared by the researcher based on the statistical program (SPSS). N = 90

Third: testing research hypotheses:

1. The first hypothesis: The interest of the company in question varies in terms of its adoption of technological capabilities. In order to prove the validity of the first hypothesis of the study, the Duncan test was approved, and by using the statistical package (SPSS), we obtained the following results:

Table (3) results of the Duncan Technological Capacity Test

T	Technological Capacity	Subgroups
		1
1	communication capabilities	4.02
2	Research and development capabilities	3.98
3	network capabilities	4.01

N=90

Duncan's test results, which are supported by the results of the analysis of variance, indicate that Zain is interested in adopting all technological capabilities without distinction, as all capabilities have close arithmetic averages ranging between (3.98 - 4.02), all of which are located in one group. Based on these results, the hypothesis of the first study is rejected, and the alternative hypothesis is accepted, as it became clear that Zain's interest in technological capabilities is not different.

2. The second hypothesis: Zain's interest in the types of technical innovation varies. The statistical treatment to test the second hypothesis requires the use of Duncan's analysis to find

out whether Zain cares about all types of technical innovation of the same importance or not. By using the statistical package (SPSS), we obtained the following results:

Table (4) Duncan Technical Innovation Test results

T	Technological Capacity	Subgroups
		1
1	Introduce a new product	**3.94**
2	New product design	**4.02**
3	Improvement of the existing product	**4.03**
4	Improvement of the existing process	**4.01**

N=90

Duncan's test results, which are supported by the results of the analysis of variance, show that Zain is concerned with adopting all types of technical innovation without distinction, as all types obtained close arithmetic averages ranging between (3.94 - 4.03), and all of them fall into one group. Based on these results, the hypothesis of the first study is rejected, and the alternative hypothesis is accepted, as it became clear that Zain's interest in the types of technical innovation does not differ.

3. Test the third hypothesis: This hypothesis states that there is a correlation between technological capabilities and technical innovation at the macro level in Zain Telecom. Table (5) shows the results of the correlation test related to this hypothesis.

Table (5) results of the correlation test in the company in question

explanatory variable / **transponder variable**	**technological capabilities**
technical innovation	*0.72

***P ≤ 0.05** **N= 90**

Table (5) indicates the existence of a positive significant correlation between technological capabilities and technical creativity, as the value of the overall index of the correlation coefficient reached (* 0.72) and at a significant level (0.05), which is evidence of the existence of the relationship between the two variables, as this result indicates that the more Zain under research, due to its interest in technological capabilities, contributed to the achievement of technical innovation for Zain under discussion by providing the appropriate environment for audit experts in the company under study and working on exchanging information accurately, and based on the results of the statistical analysis of the relationship between the two variables of the study, the second main hypothesis is accepted. At the company level under discussion.

3. **The fourth hypothesis:** All technological capabilities have a significant effect in enhancing technical creativity in the company under consideration. To address this hypothesis, the Statistical Package (SPSS) program has been relied upon. Table (6) illustrates this effect as follows:

Table (6) The effect of technological capabilities on the technical innovation of the company under consideration

The explanatory variable / The transponder variable	technological capabilities			F
	β0	β1	R^2	
technical creativity	0.701	0.691 (12.025)*	0.49	81.648

*** P ≤ 0.05 N=90 D.F=1. 88 Denotes the calculated T value (*)**

Table (6) of the regression analysis shows the existence of a positive significant effect of technological capabilities as explanatory variables in technical creativity combined as a responsive variable, as the calculated value of (F) was (81.648), which is greater than its tabular value at two degrees of freedom (1, 88) and at the level of Significant (0.05). The coefficient of determination (R2) was (0.49), meaning that (49%) of the explained differences in technical innovation are due to the influence of technological capabilities, and the rest is due to random variables that cannot be controlled or are not included in the regression model at all. From a follow-up parameter (1), it becomes evident that increasing interest in technological capabilities in one unit leads to a change of (0.691) in technical innovation, and the factor (0) means that the company in question achieves technical innovation, regardless of the effectiveness of technological capabilities, and from following up The calculated (t) test of (* 12.025), we find that it is a significant value and greater than its tabular value, at a level of significance (0.05) and two degrees of freedom (1, 88). In this way, the second main hypothesis is accepted, which states that: (There is a significant influence of technological capabilities on technical innovation in the company in question).

The fourth topic: conclusions and recommendations

First: Conclusions

1. In order to reach an integrated and effective production system, modern technological capabilities should be used that take care of all the organization's operations. For this purpose, the term technological capabilities is used.
2. Technological capabilities are among the modern concepts in the field of business administration and information systems that are adopted by communication companies in improving the quality of their service provided to the customer.
3. The good application of technological capabilities will increase the ability of Zain Telecom in the research field to develop its creative and technical capabilities in comparison with other companies.
4. There is a positive significant correlation between all technological capabilities and types of technical innovation combined for Zain in terms of its variables according to the value of the correlation coefficient at the macro level.
5. There has been a positive significant impact of the combined technological capabilities on the types of technical innovation combined, indicating that the increased interest of the company's management under research combined technological capabilities will

contribute to enhancing technical innovation through research and development capabilities, communication capabilities and networks capabilities.

Second: Recommendations

1. The management of the company in question should increase interest in the concept and types of technical innovation, as well as the concept of technological capabilities, as this contributes to and enhances the survival and growth of the company in intense competition markets.
2. Increasing the company's management interest in the types of technical innovation being one of the basic tools that assist it in introducing new products and improving existing products, as well as designing new processes and improving existing processes in order to be able to adapt to the outputs of technological development and the conditions of sharp competition in the market.
3. Zain Telecom's management should focus on technological capabilities, especially communication capabilities, and research and development capabilities.
4. The management of Zain Telecom Company should pay attention to all types of technical innovation by focusing on continuous research and development, as well as the necessity to keep pace with Zain with modern technology at work.
5. Increasing the management of Zain Telecom's interest in the contents of technological capabilities because of their role in enhancing technical creativity, and realizing that achieving efficiency in adopting these capabilities is in order to enhance technical creativity.

References

1. A. Bergek, F. Tell, C. Berggren, and J. Watson, (2018), "**Technological capabilities and late shakeouts: Industrial dynamics in the advanced gas turbine industry, 1987-2002**", Industrial and Corporate Change, vol. 17, pp. 335-392.
2. Ambrose, D. (2017), "**Interdisciplinary invigoration of creativity studies**", The Journal of Creative Behavior, 51(4), 348–351.
3. B. Y. Aw and G. Batra, (2018), "**Technological capability and firm efficiency in Taiwan (China)**", The World Bank Economic Review, vol. 12, pp. 59-79.
4. Belous, V. (2016), "**Technical creativity in machine building**", Inventics (in Romanian). Iaşi, Romania; Publishing House Junimea.
5. Belous, V., Plahteanu, B. (2014), "**Fundamentals of technical creativity**", Iaşi, Romania; Performantica.
6. Cachia, R., Ferrari, A., Ala-Mutka, K., & Punie, Y. (2010), "**Creative learning and innovative teaching**", Final report on the study on creativity and innovation in education in the EU member states. JRC 62370. European Union.
7. Costa and S. R. R. de Queiroz, (2012), "**Foreign direct investment and technological capabilities in Brazilian industry**", Research Policy, vol. 31, pp. 1431-1443.
8. Csikszentmihalyi, M., & Wolfe, R. (2014), "**New conceptions and research approaches to creativity: Implications of a systems perspective for creativity in education**", In M. Csikszentmihalyi (Ed.). The systems model of creativity (pp. 161–184). Berlin: Springer.

9. Danah Henriksen, Michael Henderson, Edwin Creely, Sona Ceretkova, Miroslava Černochová, Evgenia Sendova, Erkko T. Sointu, Christopher H. Tienken, (2018), "**Creativity and Technology in Education: An International Perspective**", Springer Nature B.V.
10. E R Lestari and F L Ardianti, (2019), "**Technological capability and business success: The mediating role of innovation**", IOP Conf. Series: Earth and Environmental Science 250.
11. F. E. Garcia-Muina and J. E. Navas-Lopez, (2017), "**Explaining and measuring success in new business: The effect of technological capabilities on firm results**", Technovation, vol. 27, pp. 30-46.
12. Feldman, D. H., & Benjamin, A. C. (2006), "**Creativity and education: An American retrospective**", Cambridge Journal of Education, 36(3), 319–336.
13. J. E. Coombs and P. E. Bierly, (2016), "**Measuring technological capability and performance**", R&D Management, vol. 36, pp. 421-438.
14. J. Jin and M. von Zedtwitz, (2018), "**Technological capability development in China's mobile phone industry**", Technovation, vol. 28, pp. 327-334.
15. K.-H. Tsai, (2014), "**The impact of technological capability on firm performance in Taiwan's electronic industry**", Journal of High Technology Management Research, vol. 15, pp. 183-195.
16. Laurentiu Slatineanu, Valeriu Dulgheru, Felicia Banciu, Margareta Coteata, Oana Dodun, (2016), "**DEVELOPMENT OF TECHNICAL CREATIVITY IN HIGHER EDUCATION**", European Journal of Engineering Education, 32(5), 573–585.
17. Livingston, L. (2010), "**technical Creativity in Higher Education**", Arts Education Policy Review, 111(2), 59–62.
18. M. Bell and K. Pavitt, (2012), "**Accumulating technological capability in developing countries**", The World Bank Research Observer, pp. 257- 282.
19. Malhotra, R., Malhotra, A., & Bana, V. (2015), "**Developing elusive frame for creativity, ICT and teacher education**", World Academy of Science, Engineering and Technology, International Journal of Information and Communication Engineering, 2(10), 49.
20. Mishra, P., & Deep-Play Research Group, (2012), "**Rethinking technology and creativity in the 21st century: Crayons are the future**", TechTrends, 56(5), 13–16.
21. Mishra, P., & Henriksen, D, (2018), "**Creativity and technology: Rethinking their role in education**", New York: Springer.
22. Nagîţ, G. (2001), "**Techniques and methods for the creativity stimulation (in Romanian)**", Chişinău, Republic of Moldova; Publishing House Tehnica-Info.
23. Nurazwa Ahmad, Siti Norezam Othman, Halim Mad Lazim, (2014), "**A Review of Technological Capability and Performance Relationship in Manufacturing Companies**", International Symposium on Technology Management and Emerging Technologies (ISTMET 2014), May 27 - 29, Bandung, Indonesia.
24. R. Rasiah and A. Malakolunthu, (2019), "**Technological intensities and economic performance: a study of foreign and local electronics firms in Malaysia**", Asia Pacific Business Review, vol. 15, pp. 181-197.

25. R. Rasiah, (2018), "**Conclusions and implications: the role of multinationals in technological capability building and localization in asia**", Asia Pacific Business Review, vol. 14, pp. 165–169.
26. T. O. Oyebisi, O. O. Olamade, and A. A. Agboola, (2014), "**An assessment of the level of availability of technological capabilities in the Nigerian telecommunication industry**", International Journal of Information Management, vol. 24, pp. 423-432.
27. V. Kumar, U. Kumar, and A. Persaud, (2019), "**Building technological capability through importing technologies: The case of Indonesian manufacturing industry**", Journal of Technology Transfer, vol. 24, pp. 81-96.
28. Y. Wang, H.-P. Lo, Q. Zhang, and Y. Xue, (2016), "**How technological capability influences business performance: An integrated framework based on the contingency approach**", Journal of Technology Management, vol. 1, pp. 27-52.