

# Understanding the Role of Technology in Strategic Decision Making and Performance Outcome in Small and Medium Enterprises

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*Dissertation / Project / Internship Report: Final Management Project 2018-2019*

Date of Submission: 25-06-2020

Date of Acceptance: 13-07-2020

**SUMMARY:** The rapid technological change has made technology a major strategic factor for many organizations which may be seen defensively, seeing technology as a problem, or gaining permanent advantage through the strategic use of technology. The study will make an attempt to analyse long term benefit of adopting technology in the organisation in terms of enhancing knowledge and skills, innovative products, providing a competitive advantage, real-time decision making and will analyse how technology plays a vital role in assisting strategic performance management. The study examines the role of technology in strategic decision making and performance outcomes in small and medium enterprises and provides insights into the role of technology in facilitating strategic performance management. It also describes the role of rapid technological change and its relationship between technology major strategic factors for organizations.

**ABSTRACT:** The small and medium enterprises (SMEs) are the enterprises that have low strength of employees and restricted capital to carry out organizational and business activities. The introduction of technological innovation accelerates the pace of research and development activities, production practices, and enhances the flow of information within the organization. The implementation of technological innovation also promotes strategic management and technological advancements in SMEs so that they are able to work as per the changing global environments and survive in the changing marketplace. The change in the technology has brought the involvement of strategic factors among the organizations which leads to the development of strategic challenges among the organizations. For accepting these competitive challenges, the strategic decision making and enhance the performance outcome have been implemented by adopting the technology related to the organizations which would show impact on the overall performance of the

organization. This implication has further help in analyzing the objective of the study providing connectivity with literature review.

**KEYWORDS:** Technology, strategy, performance, technological management, SMEs.

## ACKNOWLEDGEMENT

First, I would like to thank God, the Almighty to constantly shower his endowments upon me during my research work for its fruitful finishing on schedule.

I want to offer my sincere thanks to my coach, Dominique JEANNIOT for giving his significant direction all through my research work. His continuous help and inspiration drove this task towards its successful end.

I offer my true gratefulness for all the knowledge I could gather from my coach during this entire tenure.

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## I. INTRODUCTION

### 1.1 Research Background

#### 1.1.1 Operating environment of the organization with respect to product offering, value chain system, and product strategies

The operating environment of the organization is characterized by internal and external environments that highly influence the firm's decision-making process and the conduction of activities. The operating environment of the firm is highly dynamic and ever-changing that highly challenges the workings of the managers and leaders favorably or unfavorably. While focusing on the internal environment, it includes all those factors that are present within the organization in the form of financial resources, technological resources, corporate culture, firm's image, physical resources, and others. These resources are tangible like plant technology capacity, technical knowledge, and intangible forms like communication and information channels,

management process, organizational culture, and others. The resources are responsible for the creation and deliverance of value to customers that help the firm to achieve organizational goals. It also involves the active involvement of stakeholders such as owners, shareholders, members of the Board, working staff, firm's reputation, resources, and organizational culture who form an integral part of the internal operating environment and contribute towards the firm's growth progressively. On the other hand, the external environment is mainly composed of a general environment and task or industry environment in which the general environment consists of different factors such as technology, social, cultural, legal, demographic, and others that impact the workings of the company externally. The industry or task environment consists of suppliers, customers, strategic partners, substitute products, regulators, and competitors that influence organizational functionalities externally (Xue, Liang & Boulton, 2008).

The operational environment is also impacted by globalization and advancements and influences the product offering, value chain system, and product strategies of the firms (Burgelman, Maidique & Wheelwright, 1996). It also includes the conduction of the operation management process that is responsible for setting up plans, organizing and systemizing the production and entire operational activities (Jacobs, Chase & Aquilano, 2004). While focusing on the product offering, it includes utilization of raw materials, labor and technology to produce goods with high quality so that they could be served to the consumers with enhanced values (Krajewski, Ritzman and Malhorta, 2013). Hence, it can be said that product offering under operation management is associated with the manufacturing of the product, maintaining the quality of the product and creating services by delivering the product to the end-users. It is practiced in every sector such as healthcare, finance, supplies by using technology. It also forms an integral part of the value chain system that channelizes and systemizes the supply chain, sales, accounting, marketing, human resources, and other processes. As a result, the conduction of all these activities requires the implementation of the strategic decision-making process so that daily activities of production and services are carried out effectively (Friedrick Klemm, 2009).

The conduction of manufacturing or service delivery is not an easy process. It requires several stages and phases of work, decision making, planning, use of technology and others to produce a quality product or deliver a service properly. Moreover, when the firm is involved in

production or service provision, the operation environment must consist of different product strategies such as product design, quality management, procedure designing, inventory management, capacity, ordering, procurement, resource utilization management, and others so that the products are manufactured, processed, packaged and delivered properly. However, the conduction of each activity requires examining the current situation and providing enhanced solutions so that the efficacy of the operational environment is improved subsequently enhancing the firm's productivity (Wren & Bedeian, 1994).

The operational environment of the organization also provides valuable information about the different business aspects such as the internal working of the organization and enables the managers to make decisions by identifying the direction the company needs to proceed. The awareness about the operational environment helps the managers to distinguish between necessary and non-necessary items or procedures in the firm's operations. As a result, the managers can isolate the non-necessary workings that hamper the working process and promote necessary workings that enhance the working process. The knowledge of the operational environment prepares the managers for the crisis and he/she can guide the company proceedings by analyzing the external and internal environment. It results in enhancing the effectiveness of the firm and moves it ahead in the right direction towards reaching organizational goals (Xue, Liang & Boulton, 2008).

In order to work efficiently in competitive markets, firms must adopt strategic management approaches along with technological advancements. It helps the firm to avail of new opportunities in the marketplace and gain sustainable competitive advantage (Ramachandran, Mukherji & Sud, 2006). In addition to this, awareness of the operational environment, the adoption of strategic management helps in accelerating the flow of information and promoting management practices such as research and development, innovation, and others. The strategic management also incorporates technological advancements that help the managers to make strategic decisions in favor of the firm. For example, the knowledge of the operational environment and adoption of strategic management in the Small and Medium Enterprises (SMEs) helps the managers to deal with the changing internal and external environment effectively. The managers are also able to synchronize the workings of the SMEs as per the changes occurring at global levels. As a result, SMEs can enhance their productive activities by developing an effective resource management

plan (Berisha-Namani, 2009). Hence, it can be said that the managers that are working in the SMEs must be aware of the operational environment, strategic management and technological advancements that are taking place in the national and international environment so that appropriate changes could be incorporated with the firm to enhance the productivity and profitability of the firm.

### **1.1.2 Adoption of advancements in technology in collaboration with strategic management initiatives**

The adoption of technology and advancement is essential to gain an edge in the competitive environment. It helps in value creation and plays a crucial role in enhancing the productivity, economic growth and increasing the wealth of the organization (Burgelman, Maidique & Wheelwright, 1996). The adoption of technology in the company process also helps in the rapid flow of information and enhancing the performance of the company under complex competitive conditions. Hence, it can be said that technological changes are responsible for bringing drastic changes in the materialization, combination, interference, and progression of firms over time (Schumpeter, 1961). The operating environment also plays a major role in determining the working of organizations in the complex and changing environment and promotes better productivity and business model development (Ansoff, 1987). On the other hand, strategic management helps in managing the complexities of the business workings by using advanced technologies. The strategic management practices promote research and development activities, innovative management that helps in the effective utilization and collaboration of technology in the management practices (Bleicher, 2004).

The strategic management is also responsible to take initiatives, suggest and make decisions regarding the implementation of plans and utilization of resources. It helps in enhancing the capabilities of the firm and meets the changing demands of the consumers effectively. It also helps the firm to create value in the entire process of the value chain by providing adequate services to the consumers, owners, human resources and community (Ansoff, 1979). Due to technological changes, the value creation strategies adopted by the firm also need to be changed resulting in the formation of the new business process. As a result, the firms need to strategize their plan and develop new capabilities of the employees to meet the consumer and stakeholder's demands. The creation of strategy will help the firm to regain its position

in the market and forms the value chain again with the help of new technologies and advancements effectively (Porter, 1985).

The use of strategic management and technology in the business models helps in sustaining value creation and enhancing the survival prospects of the firm in the complex competitive market. As a result, the firm can make create chain systems, conduct production activities and generate revenue for the company effectively (Makinen&Seppanen, 2007). The adoption of advancements in technology in collaboration with strategic management initiatives also helps in strategy formation and execution of the company activities. The strategic technology management helps in the adoption of three dimensions of strategy which are setting up plans, designing, and positioning. It also enables the managers of the firm to introduce seven strategic aspects such as capitalist, cognitive, knowledge, authority, intellectual, ecological, and arrangement (Mintzberg et. al., 2005). Moreover, the adoption of technology in the strategic management process helps in aligning the business process in line with the organizational goals. For example, when the technology strategy collaborates with the corporate strategy, the firm experienced high growth propositions in terms of productivity and competitiveness (Dodgson et. al., 2008). As a result, there is the creation of a successful business model and strategy that helps the firm to achieve success milestones in a complex and uncertain environment.

The adoption of technology in strategic management helps in introducing new working environments that are run with the help of internet and digital platforms. The implementation of the internet and digital technologies helps to establish communication and interaction between employees and consumers. For instance, due to the applicability of internet services, there is the development of a virtual environment and networking system that encourages and motivates the employees to work coordinately with peers, colleagues, and subordinates. In addition to this, social networking sites such as Facebook, Twitter, and others are also used by the firms to establish communication with the consumers. The different networking sites help the firm to acquire feedback from the customers directly and resolve their issues instantly or priority basis. As a result, firms such as small and medium enterprises (SMEs) can retain their customers, provide quality services and sustain themselves in competitive markets. SMEs also adopt technological advancements such as lean production and six-sigma that help the firm to gain

operating supremacy and manufacture new merchandise. It creates product differentiation and the customers are served with better products that are having high returns and low risks (Talukder and Quazi, 2011).

Strategic technology management plays a major role in the development of business strategy and enhances the sustainable factors of the firm to work and operate in the competitive market. It promotes the implementation of a technology strategy that collaborates with different organizational aspects such as internal forces, external forces, strategic action, technology evolution, organization context, industry context, technology pull, and market pull. All these aspects coordinate and systemize the entire work process that helps the employees to work proficiently and achieve organizational goals. The adoption of technology in the strategic management process influences the external technological environment that includes different processes like attainment, research and development, licensing, and policies related to technological advancements. As a result, there is the introduction of technology management along with strategic management so that the theoretical and practical learning about the production and delivery process is gained (Burgelman et. al., 2001). The introduction of strategic technology management also promotes innovation management so that managerial issues and integrative problems that are faced by the managers and firm resolves. As a result, there is an integrative problem-solving attitude adopted by the company employees, teams, and working staff. It also develops a level of understanding between the different innovation groups, the firm's teams and the evolution of the business unit (Margaret A. White & Garry D. Bruton, 2007).

Strategic technology management is also responsible for incorporating technology into management practices that encourage innovative thoughts and working process. For example, Wal-Mart which is one of the largest retail industries has adopted RFID technology into its operations to reduce the costs that are related to labor. It also helps the company to maintain its logistics, supervise inventory activities and evolve marketing intelligence and sale activities. In addition to this, Wal-Mart has also adopted other technologies such as Point of store-level Sale (POS) systems, Central Database Network, and a satellite networking process so that all the working procedures of the company are synchronized, updated and upgraded to new technologies and work systems. In addition to this, Collaborative Planning, Forecasting and Replenishment (CPFR) has also been adopted by

the company which helps it takes an integrated approach towards the implementation of planning procedure and enables the managers to make accurate forecasts regarding the business commercial activities based on the critical information acquired from different departments such as sales, production, supply chain and others (Sahlman&Haapasalo, 2012). Moreover, RFID technology is also used by other companies such as Procter & Gamble which helps the company to maintain its logistics and supply chain process by synchronizing the supply process right from the point of origin that is demand and then ordering of consumers to the delivery when it is sold to the consumers. As a result, because of the use of RFID, Wal-Mart saved US\$ 8.4 billion yearly. Furthermore, to analyze the working of RFID technology, Wal-Mart divided its retailers into groups of two groups comprising of 12 members each. In one group RFID was applied and the other one was not connected with RFID. The group that was connected with RFID showed a better performance and was able to reduce OOS rates in comparison to the other group which was not using RFID in the supply chain process (Massuod O & Hassan S., 2012). Hence, it can be said that the use of strategic technology management is highly useful and helps in synchronizing the entire work process of the form by integrating the supply chain process, logistics, operations, sales and other departments of the firm.

### **1.1.3 Role of technology in facilitating strategic performance management in SMEs**

Small and medium enterprises (SMEs) are defined as business units that have economic, strength, size, and assets below a certain level that classifies them as small working units. In respect to this, the exact definition of SMEs differs as each country is having its own set of rulings for the classification or categorization of SMEs. SMEs are regarded as an essential component of the economy and contribute towards economic growth by providing employment opportunities and earning revenues for the businesses. For example, in North America, SMEs form an integral part of the economy with 36% and plays a major role in enhancing the exports of the country. The SMEs that belong to the agriculture and forestry industry accounts for 80% of exports, while SMEs belonging to transportation and warehousing contribute 90% towards exports. SMEs that are working in the provision of professional services account for 94% of exports and SMEs related to construction contribute 98% towards exports. While considering the European SMEs, the small

and medium business units showed better performances and outperformed the big companies by achieving 1.9% yearly employment gains in comparison to the big companies that achieved 0.8% yearly employment gains. It was recorded that Belgium SMEs contributed 32% towards exports, while Hungary SMEs contributed 24% towards exports, and Estonia SMEs accounted for 23% exports. While in India, SMEs play a major role in enhancing the Indian economy by creating more employment opportunities, contributing to exports and improving the GDP of the country. Hence, it can be said that SMEs are very essential for the growth and development of a nation and provides progressive opportunities for human, resources, and economy to grow.

While focusing on the role of technology in facilitating strategic performance management in SMEs, the adoption of strategic technology management practices in the workings of SMEs helps in optimizing the scale of functionalities that enables the units to perform better at regional and global levels. The adoption of strategic performance management also helps in synchronizing the entire work process enabling the working force to work properly and make improvements in the capital shortages effectively. For example, due to the adoption of advanced technology such as human-robot collaborative technology, the SME that was dealing in the production of Intra Ocular Lenses (IOL) was able to show to increase its productivity levels from the manufacturing of 150 products to 10000 daily. In addition to this, the company also recorded its yearly product output percentage with an increase of 15% and was able to showcase its caliber and talent in the global markets by exporting simultaneously in more than 130 countries. The SME also introduced the use of more advanced technologies such as collaborative robots into the production procedure. As a result, the firm recorded a considerable decrease in the cost of production by addressing the quality issues and reducing the excessive power consumption rates. It enables the company to provide products to the consumers at reasonable rates that helped in enhancing the sales value and developing a strong customer base (Subrahmanya, 2006).

The small and medium-sized enterprises mainly contribute to the economy by developing new products and services and providing employment opportunities to large sections of society. Therefore, SMEs need to work proficiently and adopt new technologies so that issues faced by them in the form of stiff competition by large multinational organizations, public sector

enterprises, and others reduce significantly. It will help the SMEs to grow and expand their operations and functionalities in the complex competitive markets effectively (Sun and Zhang, 2006). Moreover, the adoption of strategic technology management practices and high definition advanced technology will help the SMEs to enhance their supply chain and logistics process, standardize production process, align the different departmental activities, develop a well-networked communication system within the firm, introduce well organized and systematized inventory and supply chain mechanism, and others. All these processes will allow the SME to develop product coordination and meet the demands of the consumers by using strategic planning and technology successfully (Talukder and Quazi, 2010).

The SMEs not only adopt technology in facilitating the production process also introduce it in the knowledge sharing and knowledge management process so that strategic performance management takes place significantly. For example, when technology was introduced in the knowledge sharing process, it helped the SMEs to reduce the knowledge sharing challenges that are faced by them at the time of new recruitment of any experienced employee leaving the firm. The adoption of advanced technologies helps SMEs to develop an adequate system through which they could transfer knowledge between existing-working employees and improve learning and receiving knowledge from leaving employees. For example, the effective sharing of knowledge with the help of technology reduces the lead time issues that are faced by firms and quickly senses the changes that are occurring in the market. It also analyzes the present working condition of the SME and integrates its operations with previous knowledge. As a result, the managers can identify the solutions for the current issues faced by them and make informed decisions in favor of the company (Duffy, 2000). The proper sharing of knowledge with the help of technologies helps in reducing the cost of the firm to transfer knowledge and enhances the quality of the product. It enables the SMEs to serve their customers more appropriately and develop a strong satisfied client base (Ofek and Sarvary, 2001). Hence, it can be said that the strategic technology management process does not help in enhancing the production aspects of the SMEs but also promotes and enhances the knowledge management attributes of the business units.

The adoption of technology in the operational process of SMEs helps in facilitating

strategic performance management in SMEs by enhancing the workings of managers and allowing them to make rightful decisions at the time of crisis. The use of technology helps the managers to connect to necessary associates and industry experts by using digital interfaces such as emails, social media sites, professional websites, and others. As a result, the managers acquire rightful knowledge about different working systems and use the learning to make plans and take strategic decisions carefully focusing on the success of the SME (Durowoju, 2017). Technology plays a vital role in all SMEs irrespective of the product or field they are dealing with. For example, in the case of manufacturing SMEs, technology helps to enhance the production process by increasing the speed and quality of manufacturing in real-time. While in the case of service provider SMEs, technology introduction in the form of Information and Communication Technology (ICT) helps in integrating the entire information channels in SMEs. As a result, SMEs can establish interaction with the clients and consumers and other stakeholders on a worldwide level. ICT also promotes the use of internet services that bring technological changes in the workings of SMEs and helps them to achieve sustainable growth and profitability (Ussahawanitchakit, 2012).

The adoption of technology in SMEs helps the business units to resolve their business problems and the companies can work efficiently. SMEs work under a highly competitive environment, where the business units face constant pressure to perform well or will not be able to survive in the competitive markets. The adoption of the internet helps in identifying the competitors and keeping a watch on their proceedings easily. In the current age of technology changes, all the SMEs, public enterprises, private units, and other commercial units develop their websites and promote themselves using the digital platform to attract more consumers and increase the sales possibilities. For this, the SMEs provide details of their products and other probable launches so that clients and users remain connected with the firm. As a result, all the SMEs are well informed about their competitor's move and plan their moves or production procedure accordingly to meet the changing market demands. It helps in enhancing the productivity and performance of SMEs by reducing costs and providing valuable services to the customers. Hence, it can be said that technology plays an important role in the development and progress of the SMEs and provides them ample opportunities to flourish in the competitive market.

## 1.2 Key Definitions of Terms

**Technology:** Technology is defined as the usage of scientific learning in the practical aspects of human life so that constructive changes are brought in the working and dwelling of living beings. The concept of technology can be used in different fields such as history, agriculture, energy, construction, and other sectors. For example, in the field of history, technology is referred to as the means of restoring the ancient monuments by making effective use of industrial ceramics, mining plastics, metallurgy, and others so that environment and historical creations are protected from destruction. In the case of energy, technology is associated with the conduction of activities such as coal mining, petroleum protection, energy conservation, and others so that there is the effective utilization of resources. While considering the case of agriculture, technology includes conduction farming activities such as food preservation, poultry farming, livestock farming, and others. Moreover, in the case of the construction sector, technology is associated with the conduction of activities such as the building of tunnels, inland waterways, environmental works, and others. Hence, it can be said that there is an effective use of technology in different fields such as medicines, manufacturing industry, communication technology and others that facilitates the working of the human population.

**Strategic Performance Management:** Strategic performance management is defined as a strategy that is implemented by the managers throughout the organization to ascertain that the goals that are set by the firm are met adequately. The strategic performance management activity is conducted by establishing interactions with the employees, working for staff and personnel and communicates them simple and realistic guidelines to work proficiently and meet organizational goals. When there is an effective implementation of strategic performance management, the work activities that are disorganized in the firm are organized. There is no wasted time in the working hours of the organization and the conflicts between the employees, managers, and management are resolved to promote high productivity and performance levels among the employees. As a result, due to the implementation of strategic performance management, there is collaboration and cooperation in the working of the employees that contributed towards the development of efficient and effective teamwork. In addition to this, the adoption of strategic performance management also increases the motivational levels

of the employees by providing them personal development opportunities. It also facilitates the managers and employees to gain better learning about the organizational goals and initiatives that empowers them to work proficiently and enhance their working levels resulting in increased performance levels.

**Technological Management:** Technological Management is referred to as the management process in which the managers of the firm manage the workings of technology-based equipment and machinery so that there is the creation of an edge in the competitive markets. The technology management includes a wide range of activities such as production management, operation management, quality control, computer applications, and others so that there is the effective management of all the technology-related activities in the organization. Moreover, technology management mainly includes scientific advancements and a general understanding of the research and development activities so that all the systems and services are coordinated and collaborated (Bigwood, 2004). Hence, the implementation of technological management helps in reducing the cost of operations and developing new products by analyzing new market requirements. However, it must be considered that technology is not easy to handle or manage as it is highly vulnerable and keeps on changing without giving any predicaments. Hence, it is essential for the managers to implement policies and procedures so that there is an effective leveraging of technologies that help the firm to build and improve the workings of the organization. As a result, the firms can gain a competitive advantage by ascertaining the knowledge about the firm.

**Small and Medium Enterprises:** Small and Medium Enterprises (SMEs) are termed to be the enterprises that are having low strength of working personnel and often outperform the large companies that are having a greater number of employed personnel. For example, in countries like the United States of America and Europe, the companies having less than 50 working staff are considered to be small enterprises and the firms that are having less than 250 working staff are considered to medium enterprises. SMEs are highly innovative and work by using modern or inventive techniques so that work targets are achieved in real-time and an edge is gained in the competitive markets over the rivals (Aga et. al., 2015). In India, small and medium enterprises are governed and regulated under section 7 of the Micro, Small and

Medium Enterprises Development (MSMED) Act, 2006. Under it, small enterprises are defined as business units that have invested more than 25 lakh INR in the establishment of the corporation by investing in equipment, machinery, and space. The upper limit of investment in the case of small enterprises must not exceed more than 5 crore INR. On the other hand, in the case of medium enterprises, in such firms, the investment amount lies between 5 crore INR to 10 crore INR.

**Globalization:** Globalization is defined as the phenomenon in which different products, services or economies such as information, technology or employment opportunities are spread across the national boundaries and cultures. While considering the economic terminology, globalization is estimated to be the interdependence of countries on each other because of the conduction of free trade between them. By carry out the commercial activities as per globalized phenomenon, there is a rise in the living standard of the individuals especially belonging to less developed or developing nations by making provisions for employment chances, modern working conditions and providing enhanced accessibility to goods and services. However, negative aspects are also associated with globalization as it reduces the employment chances in developed nations by reducing the production of goods and services in high-income countries. It is because the high production of goods is moved across borders where the products are manufactured by using cheap labor and other reasonable resources. In addition to this, globalization also lays social, cultural, legal and political implications in both developing and developed nations. While considering social implications, it includes increasing the levels of interaction between the diversified populace. On the other hand, the cultural aspect includes exchanging ideas, traditions, values, and beliefs between the different traditional groups across the nations. Legal aspects include law related to trade and commerce at international borders and politically, it includes the attention and consideration that are given by international bodies such as the United Nations and others.

**Innovation management:** Innovation management is referred to as the procedure in which there is a generation, confinement, discussion, enhancement and prioritization of essential insights or promotion of alternative thinking procedure. It is regarded as the best method to capture ideas from the working staff in the organization and helps in the

establishment of a collaborative workforce that recognizes the efforts of the working personnel by interacting with them. It also includes the active involvement of stakeholders so that the ideas given by them could also be analyzed and included in the process of an innovative management process. Moreover, in the present times, the establishment of innovative management practices and culture has become an important aspect of the organization as it helps in the promotion of innovative ideas and contributes towards sustainable work practices. Another advantage of the implementation of innovation management is the attainment of the decentralization process that helps to the difference between the workings of the mid-level managers and C-level executives. As a result, due to collaboration in the workings of both the distinguished levels, there is an appropriate exploration of ideas and development of a stronger innovative strategy to carry out company functionalities in an improved manner. Hence, it can be said that innovation management is a practice that enhances the firm's performance by reducing costs and developing innovative business models.

**Research and Development:** Research and Development are defined as an activity in which innovative practices take place to create unique products and services. In respect to this, all the companies and organizations carry out research and development activities so that there is the development of new products and services within the organization. For example, the firms that are belonging to certain sectors such as pharmaceuticals, software, and others are required to carry out research and development activities by investing a huge amount of money in this process so that new and better products are launched in the service of the humans. In addition to this, the research and development activities that are carried out by firms help them to introduce new products in the market and bring improvements in the products that are currently offered by them. As a result, by providing better quality products, it enables the firms to stay ahead and get an edge in the competitive markets. Therefore, research and development are regarded as a separate department in most the organizations where all the innovative and development activities are carried out by exploring new facts so that there is the development of new or improvised products. The conduction of research and development activities is based on different models that facilitate the working of the firms. For example, in the department staffed model, the technical team of the firm is responsible for creating new products by

carrying out intensive investigative or researching procedures. On the other hand, in the second model that is associated with the research and development process, there is the involvement of industry scientists and scholars so that new products are developed or improvements are brought in the existing products by carrying out research activities.

### 1.3 Research Problem

In the current times, technology and the adoption of changes as per the change in technological advancements have become one of the major constraints for the effective working of the organizations. Under such conditions, it has also become important for the managers and other authorities to adapt the workings of the firm as per the innovative changes by developing new scenarios so that there are expansion and restructuring of the entire work process. While considering the case of SMEs, the performance of these organizations is highly impacted by several factors such as individual performance, team efficacies, technological changes, and others. Therefore, it has become important for SMEs to work as per the changing technological aspects so that the firms will be able to retain their talented working staff within the organization (Burnes, 2004). While considering the case of SMEs in India, SMEs face issues related to the adoption of technology because of the lack of proper expertise and skilled labor. In addition to this, the companies also face issues regarding the handling of new technological changes because of a lack of expertise and knowledge about the new production or management processes. There are other issues such as unfavorable financial policies with respect to the implementation of new technological equipment or machinery that hampers the working of the organizations. The other issues such as inappropriate socio-economic environment is also to be taken into account while considering the role of technology in strategic decision making and performance outcomes in small and medium enterprises so that no issues are faced by the forms after the adoption of methodologies in the production or manufacturing process.

### 1.4 Aims and Objectives

The specific objectives of this study are:

- To examine and understand the role of technology in strategic decision making and performance outcomes in the small and medium enterprise
- To analyze the long-term benefits of adopting technology in the organization in terms of enhancing knowledge and skills, innovative



products, providing a competitive advantage, real-time decision making

- To analyze how technology plays an important role in facilitating strategic performance management
- To examine the role of rapid technological change and its relationship between technology a major strategic factor for many organizations.

### 1.5 Contribution of the Study

The rapid technological change has made technology have created issues in the conduction of the strategic management process in many organizations. It is because technology is observed as a change that is to be accepted by the firms by enhancing the working abilities of the employees and other staff so that work is carried out with high efficacy levels. The present study analyzes the facts related to long term benefits of adopting technology in the organization in terms of enhancing knowledge and skills, innovative products. It also includes providing a competitive advantage, real-time decision-making process so that the managers can guide the employees to work under changing work conditions. The study also describes that technology plays an important role in the development of industry and economy by promoting sustainable advancements and creating a conducive work environment. It includes the use of information and communication technology to ensure that SMEs do not lag and work proficiently and survive in the globally competitive marketplace effectively (Berisha-Namani, 2009). In addition to this, the study also examines the role of rapid technological change and its relationship between technology major strategic factors for organizations and provides valuable information related to the role of technology in facilitating strategic performance management.

### 1.6 Thesis Structure

#### • Chapter 1: Introduction

This section of the chapter will include a brief description of the topic that the researcher is going to conduct the study. This will also discuss the different parameter that is included in the research study like problems and significance of the study.

#### • Chapter 2: Literature Review

This section will include all the information which are collected by the researcher related to the various past study research studies. It will help to provide a general understanding of the research study topic.

#### • Chapter 3: Research Methodology

This section will include all the processes and approaches that will be used by the researcher to

collect and analyze the facts and figures in a proper manner.

#### • Chapter 4: Data Analysis

This section will present all the collected data by the use of thematic presentations in the form of bar graphs, pie charts, etc. In addition to this, various kinds of statistical tools will be used in order to analyze and determine accurate results.

#### • Chapter 5: Results and Discussions

This section will effectively analyze the different facts and figures that have been collected by the researcher.

#### • Chapter 6: Conclusion

This section will include all the results and outcomes that have been acquired after conducting the effective examination of the data collected by the researcher. This section also includes the recommendations of the researcher, limitations faced during this research and the future scope of work.

## II. LITERATURE REVIEW

### 2.1 Introduction

The study discusses the technological innovation and effect on the working factors for SMEs and technological advancement and reduction in complexities faced by SMEs. The study also provides valuable information about advanced digital technology and employee-consumer interaction for SMEs, adoption of technology and effect on SME's production performance and technology as a business tool and system functioning of SMEs. The research gap has also been included in the study so that reads get better learning about the research topic.

### 2.2 Technological innovation and effect on the working factors for SMEs

According to Berisha, & Pula, (2015) small and medium enterprises have been classified into small and medium enterprises separately. As per the World Bank standard, small enterprises are the business units in which the number of employees is more than 10 and less than 50. While the total assets of the small enterprises are more than \$100,000 and less than \$3,000,000 and the total annual sales are more than \$ 100,000 and less than \$ 3,000,000. In the case of medium enterprises, the number of employees is more than 50 and less than 300. While total assets of the small enterprises are more than \$3,000,000 and less than \$15,000,000 and the total annual sales are more than \$ 3,000,000 and less than \$ 15,000,000. While focusing on the conceptualization of SME in

quantitative terms, it is defined as an industry that is ascertained by its strength of employees or annual turnover determined by the commercial enterprise. On the other hand, the qualitative analysis of the SME conceptualization includes a description of its three vital elements which are management, market share, and control decision making power within the firm. Yon and Evans, (2011) examined that while considering the management concept, the attribute of the proprietor and their personalities are to be taken into account. It includes carrying out functionaries as per their nature and attitude. The personnel factor is also included which determines the all-round knowledge requirement in the conduction of organizational activities. The organization and sales aspects are also included that ascertains the networking and comparative position of the firm in the competitive markets. The buyer relationships, production, research and development, and financial aspects are also determined in the SME that is different from the large companies. For example, in SME, finance is mainly contributed by family funds or self-financing while in the case of the large enterprise; finance is mainly accessed through the capital market or diversified ownership structure. Hence, it can be said that in quantitative terms SMEs are essential economic components of developing countries that generate employment opportunities and profits (Gibson and van der Vaart, 2008). On the contrary, in the qualitative terms, SME, are legal entities that are majorly operated by the owner by forming organizational structure and contributes towards the economy and legal autonomy by holding a rigid position in the market (Decker et. al., 2006).

### **2.3 Technological advancement and reduction in complexities faced by SMEs**

According to Bhoganadam, Rao, &Dasaraju, (2017) the major challenges that are faced by SMEs are external, infrastructural, human resource development, financial, marketing, production, socio-cultural and environmental challenges. While focusing on external challenges it includes social, cultural, literacy, background, networking and other factors that influence the working of employees in an organization. On the other hand, internal factors such as manufacturing, human resource development, infrastructure, and other factors also impact the commercial activities of the firm. For example, production challenges are faced because of lack of skilled labor, absence of adequate resources, poor quality of raw materials, shortage of advanced machinery and others. The marketing challenges such as lack of networking

channels, absence of proper promotional activities, late delivery ill-effects and absence of synchronized distribution channels negatively impact the organizational working.

Badrinarayanan& West, (2010) examined that technological advancements are highly responsible for accelerating the pace of growth and development in SMEs and creates opportunities in which firms reinvent and grow exponentially. Ramayah, Osman Omar &Marimuthu, (2009) examined that Information Technology (IT) highly contributes to the development of the economy and brings a significant change in the working of industries. For example, the implementation of technological advancements in the SMEs helps them to facilitate expansion in new markets. The technology introduction also helps in establishing networks and organizing the supply chain process so that the company works properly and effectively. For example, the introduction of innovative technologies such as electronic commerce, internet-based technological advancement, digital solutions, advanced information technology, communication interfaces, and others help in the proliferation of SME business activities.

Bowman and Gatignon, (1995) examined that the adoption of technological advancement helps reduction of working complexities faced by SMEs. For example, the implementation of advanced technology helps the SME to reconfigure its position in the competitive market by enhancing, organizing and synchronizing its production, marketing, and organizational functionaries. Porter, (1980) examined that technology brings rapid changes in the development of SMEs by reducing the uncertainty and risks levels and providing business firms with growth and market opportunities. In respect to this, it is essential for the managers of SMEs to keep two considerations into account which are related to implementing rightful emerging technologies as per the SME requirement. The factor is the timing of the adoption of technology.

Grandon and Pearson, (2004) analyzed that adoption of technology varies among the SMEs and regarded as a strategic tool that is used by the managers to overcome the vocational and temporal challenges. In addition to this, the adoption of technological advancements helps in the adequate deployment and utilization of resources so that the SMEs are able to achieve their set goals effectively. The technological innovations also develop proper communication channels, organize and systemize the working of the firm by establishing interactions between the associates,

employees, customers, and clients. It also synchronizes the entire production, warehousing, logistics, supply chain process that helps the SMEs to conduct their commercial activities effectively.

Weerawardena, (2003) analyzed that the implementation of innovative technological practices helps the managers to introduce new ideas and provide valuable products to the customers by enhancing the quality of the products, procedure, managerial arrangement or marketing system. As a result, SMEs are able to increase their performance levels and sustain themselves in the competitive market by meeting the production, infrastructure, marketing, and other challenges. Hence, SMEs must adopt technological advancements so that they could adapt to the changing market and customers' needs quickly.

#### **2.4 Advanced digital technology and employee-consumer interaction for SMEs**

Camilleri, (2018) examined that the implementation of digital technology and information and communication technology (ICT) help the SMEs managers to carry out the organizational activities more actively by establishing websites and communication channels with the consumers. Taylor and Murphy, (2004) examined that the due to incorporation of ICT and internet, the SMEs promote themselves by using different promotional tools such as websites, emails, social networking sites, professional networking channels, and others. The adoption of digital technologies provides an automated base to SMEs by creating communication systems with different stakeholders such as clients, customers, and others. As a result, SMEs are able to interact with customers and acquire their feedback properly. It results in the development of increased customer engagement levels and the SMEs are able to meet the changing needs of the clients significantly.

According to Maranville, (1992), technological innovations are referred to as the advancements that are implemented by the firms and enterprises to meet the changing market demands. It also enhances the economic value of the products by continuously upgrading as per the consumer demands and needs. For example, the adoption of digital technology enables SMEs to establish interaction with the customers in real-time by using different social media sites such as Facebook, Twitter, Instagram, and others. As a result, there is a development employee-consumer interaction that increases the involvement of customers in the company process. It also helps in the co-creation of content and immediate engagement of the public in the organization's

activity by creating a digital platform with the help of the internet.

Camilleri, (2017) examined that the SMEs use different online strategies and social software such as electronic forums, social media networks (Facebook, Twitter, Instagram), blogs, websites, professional networking sites such as LinkedIn, wikis, and others to develop communication and interaction with the different stakeholders such as consumers, clients, and others. Castello, Morsing and Schultz, (2006) examined that the use of technological advancements such as internet services helps SMEs to connect and network with customers by using different means such as direct association with the help of emails, or indirectly with the help of digital community forums. The introduction of technological advancement such as internet services enables SMEs to develop associations with digital users and take benefits of the positive reviews that are provided by the consumers. The SMEs post and re-post the positive publicity gained by them in different portals that helps in promoting the company by using word-of-mouth marketing in real-time. As a result, SMEs are able to develop and strengthen their client and customer base that become the brand ambassadors of the company and promote the SME's products or services to masses easily and interactively.

Lamberton and Stephen, (2016) examined that the digital or internet adoption by SMEs helps it to develop dynamic relations with the customers. It is because, with the help of digital technologies and social media platforms, the employees of the SMEs are able to speed up their interaction and communication process. For example, the employees use different digital technology-based tools such as blogs, emails, websites, chatbots, social media, and others to establish a direct conversation, dialogue, and interaction with the consumers. Moreover, when SMEs share their information with the stakeholders by using a digital platform, there is increased participation of the stakeholders in the form of followers. It enables the stakeholders to directly share their views and opinions about the firm, its products, and services with the SME employees. As a result, the employees are able to receive feedback and record the reviews of the users effectively. Hence, it can be said that technological advancements such as the internet and social media are highly beneficial for the SMEs as it develops employee-customer interaction and proposes an improvement in the organizational workings.

## 2.5 Adoption of technology and effect on SMEs production performance

According to Machii&Kyalo, (2016), SMEs are resourceful enterprises that are accelerating economic growth by generating employment opportunities and alleviating poverty levels. The introduction of technology into the working of the SMEs provides them dynamism by enhancing their production, delivery and other mechanisms. For example, the introduction of information and communication technology (ICT) into the workings of the SMEs enables the firms to enhance their quality services, improve delivery activities, systemize bureaucratic practices, and gain an edge in the competitive markets. Akunyili, (2010) examined that when technological advancements are introduced in the workings of the SMEs, the firms are able to confine, change, convey and allocate interaction of information adequately. SMEs are able to use technological equipment such as computers and other portable devices to record, update and maintain the organizational activities. It also enables the SMEs to connect the firm with global consumers by establishing connections with them with the help of different networking sites by using the internet.

Harrigan, Schroeder, Qureshi, Fang, Ibbotson, Ramsey & Meister, (2010) analyzed that the adoption of ICT helps SMEs to establish interaction between the employees and the consumers. As a result, due to the communiqué of information, there is an improvement in customization and attainment of consumer and market trends. It helps the employees to coordinate with others, reduce the cost of production, and escalate the strength of customers. In addition to this, the employees that are related to the marketing segment are able to promote the company products and services to large audiences and customers by using the internet and several digital platforms such as websites, blogs, social media sites, and others. Hazbo, Arnela& Chun-yan, (2008) examined that ICT is regarded as a catalyst and a vital tool that promotes organizational change in the SMEs. For example, due to the adoption of ICT, the logistics and warehousing activities are coordinated that promote the effective working of the entire supply chain process. As a result, the SMEs deliver products to the customer on time and meet the customer feedback and grievances in real-time.

The adoption of advanced technologies like information technology (IT) improves the productivity levels of the SMEs by systemizing and organizing the entire work processes. For example,

the use of the internet in the form of electronic commerce enhances sales that increase the productivity of SMEs. In addition to this, the use of IT applications automates the operational procedures that are carried out by the working force of the SMEs. The IT application in SMEs also reduces the cost of conducting business as it strengthens the working efficacies of the employees and reduces the reach out time to the customers. For example, due to the adoption of digital technologies such as websites, the managers of the SMEs are able to promote their goods at low cost as compared to other means of traditional advertising such as print media or billboards. In addition to this, the IT adoption also increases the profit-earning capacities of the SMEs by providing them better production approaches, reducing wastage and enhancing the working abilities of the employees. Vallee, (1999) examined that due to the establishment of digital interfaces, SMEs are able to connect with local and global markets and mark their presence to large consumers. For example, by using social networking sites, the SMEs promote their product and services to diversified audiences and create their presence at national and worldwide levels. Hence, it can be said that technology highly benefits SMEs by enhancing the performance of the employees and increase productivity and profitability levels.

## 2.6 Technology as a business tool and system functioning of SMEs

According to Prasanna (2014), SMEs perform several activities such as inventory management, logistics maintenance, supply chain process, customer or supplier relationship management, and others. In respect to this, most of the SMEs carried out data and inventory management activities by using the manual process which created a lot of pressure on the employees and consumed a lot of time. Under such cases, the adoption of technology by SMEs helps in storing, maintaining and updating the inventory details along with historical data economically. As a result, the employees are able to access the required information about the delivery or tracking the order quickly which increases competence and correctness in job performance. Moreover, the adoption of technological advancements such as information technology (IT) adoption helps in handling the operational data effectively. It also enables the managers to use the information appropriately and make informed decisions in favor of the company. The data collection and recording by IT applications help in enhancing the learning of

the employees and managers and they are able to work and make decisions more proficiently.

Internal control is majorly related to the determination of control environment, risk assessment, operational control activities, monitoring & evaluation system, and information & communication system. When technology advancements are adopted by the SME in their internal control system, the effectiveness of the operations rises as their proper allocation and utilization of resources. Technology adoption also helps in reducing the risks that arise because of poor business decisions, non-compliance, and public scandals. Sampson, (1999) examined that the adoption of technology helps in reducing the imbalances that are present in the SMEs because of excessive controls in the form of increased bureaucratic supremacy. As a result, due to the adoption of technology and the attainment of rightful information, there is a reduction in cycle time, a decrease in non-value activities, avoidance of complexities, and an increase in productivity levels.

The adoption of technology by SME provides flexibility which encourages the employees to create and implement new ideas. It also reorganizes the firm's structure, reduces risks that are associated with the repetition of the tasks and facilitates the organization to be more innovative. As a result, there is the development of new products that enhances the internal competence of the firm and meets the changing demands of consumers effectively. Moreover, due to the adoption of technology, the technology, the employees are able to work from home, work at flexible hours which helps in developing work-life balance and creating a positive working culture in the workplace. Danneels and Kleinschmidt, (2001) examined that the innovation helps in enhancing the technical competence of the firms and the working staff is able to recognize and respond to the consumer's needs immediately by creating new products or making improvements in the existing commodities. Hence, it can be said that the adoption of technology by SMEs helps them to systemize their working procedures by managing risk, developing new products and meeting customer demands.

## 2.7 Research Gap

As per the above-discussed literature review, it was found that small and medium enterprises are SME are essential for the growth and development of developing countries as they highly contribute towards generating employment opportunities and increasing revenue collection

activities (Gibson and van der Vaart, 2008). However, technological adoption and implementation in SME are not adequate as they face financial constraints, lack of knowledge, lack of infrastructure and other challenges. It also includes barriers related to limited government support, lack of vendors and lack of understanding by managers. As a result, there is the creation of a gap between the enhanced performance of SMEs and the measures that must be adopted by them to increase productivity and performance levels. The study also examined that the study is limited to small and medium enterprises and the micro and other industries have not been taken into consideration which is also facing similar issues like SMEs. In addition to this, the gap has also been identified between the previous and existing literature as there are not many studies that cover the technological adoption and implementation facts about SMEs. Hence, the current study will help to fill all the gaps by carrying out intensive research and provide more relevant information about technological innovation and effect on the working factors for SMEs.

### III. RESEARCH METHODOLOGY

#### 3.1 Introduction

The notions 'research' along with 'research methodology' are often described to advanced research within academics. However, we utilize these terms here in an extensive sense, alluding to some specific sort of information age that likewise incorporates researches done by students as well as professionals. The primary situation is that the particular research action clings to quality measures, containing validity, quality, saliency, and so on. These rules should be adjusted to a particular objective of transformational sustainability research (Wiek and Lang, 2016). The aim of the research methodology chapter is to describe how a research work has been performed in order to accomplish the objectives of the given study. The research methodology must be assigned in such a way which is self-explanatory and gives an insight into the study. In order to conduct research, it is mandatory to understand what are the motivations linked to the research and are the ideas and theories adopted for the research. A research methodology is one of the relevant sections of the research (Fletcher, 2016). In order to conduct this study systematically and logically, the current chapter will define research paradigm, approach, design, data collection method, sampling, data analysis and ethical consideration in context of the recent study.

#### 3.2 Research Paradigm

Paradigm can be considered as the assembly of variables, concepts, and problems related to the research methodology of the study, including research approaches and combined instruments. This can also be explained as the framework of the assumptions and values (Chilisa and Kawulich, 2012). A research paradigm is further divided into Positivism and Interpretivism research paradigm. Positivism is the primary form of the research paradigm and is focused on developing the appropriate results through certain scientific methods. Interpretivism is the exact opposite of positivism, which includes qualitative research. This paradigm aims at developing a much better concept and exploring the facts linked with the phenomena (Clarke, 2009).

The study taken up is conducted with the aim to understand the role of technology in strategic decision making and performance outcome in small and medium enterprises. A positivist approach has been adapted for the current study since the research desired to move from general to specific sort of study using some scientific measures. This positivist approach is

supported by quantitative data collected by the researcher in order to get desired results.

#### 3.3 Research Approach

Research approaches offer a complete plan with required methods and appropriate strategies. Research is divided into two parts according to research problem identification. The research approach can be divided into two sections namely Quantitative research approach and Qualitative research approach (Jackson, 2015). A qualitative approach is a subjective and a comprehensive research approach which results in some sort of a discovery. In this research approach, a researcher aims to explain a social phenomenon from the perspective of the participants chosen for the purpose of research. The quantitative research, as the name suggests, deals with quantities and examines the relationship between the defined variables. The quantitative research approach is less or more related to the basics and concepts defined by science (Taylor, 2010).

To address the objectives of the study, this research used Quantitative approach including the combination of both primary and secondary resources. For the purpose of this study, a number of questionnaires were conducted in order to understand the viewpoints of respondents regarding the same.

#### 3.4 Research Design

The research design is an overall framework or setup of the research which is combined in order to conduct and complete the study logically and systematically. It serves as the draft in order to collect, measure and examine the data. According to Salkind (2010), research design is further divided into sub-sections such as Exploratory research design, Explanatory research design, Experimental research design and Descriptive research design.

The present study aims to understand the role of technology in strategic decision making and performance outcome of small and medium sized enterprises with the various objectives such as analyzing the long term impact of technology in an organization, studying the importance of technology in facilitating strategic performance management and examining the role of rapid technological changes and their relationship with technology. For this purpose, the study adapted 'descriptive research design' which was found to be suitable for the study. This design helped the researcher to understand the viewpoints of respondents towards the role of technology. Moreover, the design aims to make justification

with present practices for the same topic, and develops new and unique concepts.

### 3.5 Data Collection Method

Maxwell (2012) stated that “data collection” is an important and crucial feature of any research. Data collected through various sources incorporated as a major component with which the research methodology is simplified. Data collection can be performed through two major techniques namely primary data collection and secondary data collection.

The recent study has used both primary and secondary data collection methods in order to conduct the study logically. Few sets of questionnaires were provided to 20 small and medium enterprises along with approximately 300 managers, executives and workers who are working within these industries. These questionnaires contained the mixture of close ended questions that incorporated a few multiple choice questions. The participants or respondents were asked to select the extent upto which they agreed and disagreed.

### 3.6 Population and Sampling

In order to answer all the questions of the study, a researcher is required to be able for the data collection from each and every aspect, therefore, the demand for ‘sample selection’ is very crucial and imperative. The ‘research population’ or ‘study population’ is a complete set or group of resources through which the study sample has been selected and analyzed for further research methodology (Taherdoost, 2016). Sample size determination, in order to minimize and avoid errors it is more important for a researcher to generalize the sample than to go for any random sample. Sampling frame selection is the next step in this, this includes analyzing and selecting a definite frame consisting of all your required samples in which study needs to be done. Sampling is further divided into “Probability” and “Nonprobability” technique (Yin, 2013).

The target population for the current study was 20 small and medium sized enterprises. 300 participants were selected for the questionnaires including managers, executives and workers. The chosen technique adapted for the study was ‘probability sampling’ technique, due to the particular selection of a certain sector for the conduction of present study. Furthermore, the chances of an individual getting selected in this method is calculated and fixed.

### 3.7 Data Analysis and Interpretation

Data analysis is considered as one of the most important aspects of any research in order to conduct the research successfully. The notion of data analysis includes various approaches and measures and also uses enormous techniques for data interpretation (Selena and Gong, 2014). The researcher selects the data analysis tool, as per the data collected through various approaches, which would be most suitable for the study. The quantitative data is analyzed by the use of various statistical tools such as SPSS, ANOVAs and Chi-square tests. As the data is collected in numerical terms and requires to be transformed into charts and graphs. The interpretation makes study and results look easy to the audience and they can comprehend it easily.

### 3.8 Ethical Considerations

Research ethics contain the requirements on work, the conservation of nobility of issues and the publication of the information in the research. Ethical consideration is the most crucial and important section of any research. The protection and safety of human subjects are important through the application of suitable ethical principles in any research or study (Arifin, 2018). Ethical considerations play a particular and vital resonance because of the comprehensive essence of the entire process of study.

## IV. DATA ANALYSIS

### 4.1 Statistical Analysis

The statistical analysis was determined on analyzing the management functions, structural transformations, competition, socio-economic functions, marketing, operations, strategic focus (leadership, team building, planning). It was found that 32.3% of the respondents responded for the competition which comprised the maximum respondents' response. Strategic focus (leadership, team building, planning) was expressed by 30% of the respondents. Operations were determined by 23.6% of the respondents. 17.5% of them responded for the structural transformations. Socio-economic functions were expressed by 17.1% of the respondents. Marketing was also analyzed with the involvement of 16% of the respondents. The remaining 9.5% of the respondents were focusing on the management functions.

#### 4.1.1 Chi square tests

The chi square test has been used for testing the relationship among the variables for analyzing the statistical hypothesis which are usually under the null hypothesis. The respondent's opinions were determined for the chi square test

regarding the creativity, monitoring, communication and mix strategy, sales (negotiations and retailing), packaging, product development and formulation, business plan, project management and ethics and sustainability. The p value has been used for analyzing the probability of the Chi square statistics. The chi square value signifies the p value. The corresponding p value lies between 0.10 and 0.05. Hence it has been stated that the p value if is less than the significant value, the null hypothesis is not accepted. Different chi square tests concerning all the above opinions of the respondents were performed for the given research study which are elaborated as follows:

#### Test-1

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding creativity.

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding creativity.

The chi square value regarding the creativity was found to be 45.224. Its corresponding p value was found to be  $0.000 < 0.05$ . Here, the p value was found to be less than 0.05 which indicated that there is a significant difference in opinions of the respondents regarding creativity.

#### Test – 2

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding monitoring, communication, mix strategy.

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding monitoring, communication, mix strategy.

The chi square value for this was found to be 141.821. Its corresponding p value was estimated to be  $0.000 < 0.05$ . Hence, it was observed that p value was found to be less than the value 0.05 which implies that there was significant difference in opinions of the respondents regarding monitoring, communication and mix strategy.

#### Test – 3

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding sales (negotiations & rating).

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding sales (negotiations & rating).

The chi square value was found to be 13.24. Its corresponding p value was found to be  $0.00 < 0.05$ . This p value was determined to be less than 0.05, concluding that there is a significant

difference in opinions of the respondents regarding sales (negotiations & retailing).

#### Test – 4

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding packaging.

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding packaging.

The chi square value was found to be 136.601. The corresponding p value was determined as  $0.000 < 0.05$ . Here, the p value was observed to be less than 0.05, concluding that there is a significant difference in opinions of the respondents regarding packaging.

#### Test – 5

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding product development & formulation.

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding product development & formulation.

The chi square value was found to be 85. The corresponding p value was determined as  $0.000 < 0.05$  which indicated that p value was found to be less than 0.05. This implies that there is a significant difference in opinions of the respondents regarding product development & formulation.

#### Test – 6

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding business plan.

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding business plan.

The chi square value was found to be 131.722. Here also the corresponding p value was determined as  $0.000 < 0.05$ . The p value was observed to be less than 0.05, hence implicating that there is a significant difference in opinions of the respondents regarding the business plan.

#### Test – 7

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding management.

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding management.

The chi square value was found to be 161.532 and its corresponding value was determined to be  $0.000 < 0.05$ . Here also the p value was analyzed to be less than 0.05 which implies that there is a significant difference in opinions of the respondents regarding project management.



### Test – 8

**Null hypothesis:** There is no significant difference in opinions of the respondents regarding ethics & sustainability.

**Alternate hypothesis:** There is a significant difference in opinions of the respondents regarding ethics & sustainability.

The chi square value was found to be 10.107. The corresponding p value was determined as  $0.000 < 0.05$ . Here, the p value was found to be less than 0.05, implicating the fact that there is a significant difference in opinions of the respondents regarding ethics & sustainability.

#### 4.1.2 ANOVA

ANOVA test helps in analyzing the hypothesis of the study whether to reject the null hypothesis or accept the alternate hypothesis. The statistical differences between the independent variables are also determined. In the given study, the significant difference in the determinants in different sectors was determined by applying the analysis of variance using SPSS. The determinants in different sectors included creativity, monitoring, communication and mix strategy, sales (negotiations and retailing), packaging, product development and formulation, business plan, project management, ethics and sustainability. Various tools such as sum of squares, degree of freedom (df), mean square, f value and significance are used in ANOVA for determining the significant difference of the technology with the different sectors of industry that is provided in the given table. Hence it was observed that none of the factors determining the technology had a statistical difference with the different sectors of industry.

## V. RESULTS AND DISCUSSIONS

### 5.1 Introduction

The outputs of the primary research analysis consisted of the graphs and tables generated by using SPSS software. These graphs and tables were the result of analysis of the surveyed data which helps in understanding the role of technology. The surveyed questionnaire included questions based on the role of technology which mainly involved the small and medium sized enterprises along with the managers, executives and workers who were working in such kinds of industries. Statistical analysis was used for analyzing the questionnaires and presenting the effect of judgement. The tools such as ANOVA, SPSS and Chi square tests were used for providing the accurate and reliable results which helped in linking the main objectives of the research in the current study.

The results obtained on analyzing the collected data implicated that the overall performance of the organization may be enhanced by adopting the advanced technology which would help in making strategic decisions and also analyzing the financial performance. The adoption of advanced technology has evolved the latest information system that would help in enhancing the working in the small and medium sized enterprises. The analyzed data in this study has also shown technological advancement helps in improving the efficiency of the business. The SMEs also indulge into various challenges, but the innovative technologies involved in such organizations would help in meeting those challenges and reducing them. The managers and other workers meet up the challenge of cost efficiency and the technology management which is challenging for making strategic decisions in SMEs. In the given study, the analyzed data has interpreted that the SMEs have adopted technologies such as manufacturing, processing, monitoring, and planning which helps in gaining operating excellence and producing new products and establishing communication and interaction between the employees and the consumers. The present study has also implicated data analyzed on technologies as business tools such as creativity, monitoring, communication and mix strategy, sales (negotiations and retailing), packaging, product development and formulation, business plan, project management, ethics and sustainability. These are considered as variables that help in proper functioning of the SMEs.

The literature review has concluded the technological innovation, advancement, effect on the working factors of SMEs along with the adoption of technologies to improve performance of organization and develop communication skills and interactions of the consumers and employees in small and medium enterprises. The analysis on these literatures have evolved by interpreting the result and concluding a major aim of the study. The SMEs have involved technological innovations for enhancing the working of SMEs. The ICT is the major factor in achieving business opportunities along with other sustainable growth and profitability. SMEs need innovative technology for improving the economy of the organization. This technology can enhance the SMEs by providing social value, and workforce demographics making a significant impact on the product and service processing. The role of IT and communication within the organization has helped in improving the efficiency of the consumer and the suppliers' relationship. Technology provides innovative ideas

that have a positive impact on the workforce with improved productivity level.

The complexities have been found among the small and medium enterprises which must be reduced by implementing technological innovation so that the issues of cost related to production and promotion is reduced. The adoption of such technology has also evolved in the elimination of traditional supply chains and implementing advanced mechanisms for good product coordination. The SMEs have also adopted innovative technologies such as lean manufacturing and six sigma's for gaining operating benefits and production of new products.

Also, the business tools are used for the implementation of long-term strategic decisions which in turn encourages the employees to use the innovative technology for improving the performance outcomes in the small and medium enterprises. Thus, all these factors have helped in evolving the research gap of the study and developing conceptual framework for revealing the relationship among the different variables involved in the research study.

## 5.2 Discussion on Statistical Data

The given research study aims to examine and understand the role of technology involving the strategic decision making and performance of small and medium-sized enterprises. Therefore, this study has adopted a quantitative research method to reach the objective of the given study. The survey method has been adopted for the collection of information using close-ended questionnaires. 5 points Likert scale has been used for collecting the information based on role of technology and analyzing the long-term benefit of adopting technology in organisation in term of enhancing knowledge, skills, innovative products providing, competitive advantage and Real-Time decision making. The small and medium-sized enterprises along with managers, executives and workers are involved in data collection who are working in these industries. Data analysis methods have been used for obtaining the result of the collected data in the given research study. The data analysis methods involve statistical analysis tools such as SPSS, descriptive analysis, Chi-square test and ANOVA. These tools have been effective in providing accurate and reliable results for the given research study. Below are the analyzed results of the given study:

### 5.2.1 Descriptive statistics

The descriptive analysis was analyzed by calculating the frequency table for analyzing the

outcomes of the questionnaire from the survey that was carried out in the given research. The percentage including the cumulative percent was estimated for the desired requirements mentioned in the survey. The different surveys were hence conducted for determining the objective of the research study. The descriptive analysis for the given study is determined as below:

The analysis of respondents' age group was implemented. Almost 46.0% of the respondents belonged from the 31-40 years age group. Only 4.6% of the respondents belong into the 51-60 years of age group which is the highest one. 36.9% of the respondents were from the 21-30 years age group. Therefore, the highest number of respondents were found to be from the age group of 31-40 years.

The gender analysis was another statistical analysis. About 58.2% of the respondents were found to be males and remaining 40.7% were the female groups with 1.1% of the population with no preference stated. Therefore, the male population was dominant over the females in the given study.

The designation of the respondents was also considered for the analysis. The different designation included the accounts executive, analyst, application engineer, assistant manager, assistant vice president, business controller, associate, consultant, data developer, executive, head digital marketing, junior strategy consultant, manager, partner, procurement analyst, and many more. Among all the designations, most of the respondents were designated with the position of the manager with 33.3% from the population.

The number of workers who were working in the organization were determined through the statistical analysis. Almost 57% of the respondents have expressed their views that 500 workers were working in the organization. This was the highest number of workers who were working in the organization. Only 8.7% of the respondents were expressing their view that less than 100 workers worked in the organization.

The classification of the organizational sectors was equally determined. About 35.0% of the respondents expressed that their organization is classified with manufacturing. The automobile sectors were found to be the least one in organizational classification with the response of 8.7% of the respondents.

The response on the availability of the Research and Development department in the country was also analyzed. Around 54.4% of the respondents had a positive response and the remaining 45.6% have the negative response on this analysis.

The dedication of the organization's staffs towards new innovative technology were also determined. Higher number of respondents agreed on the dedication of the organization's staff towards a new innovation strategy with the response of 71.1% of the respondents. 28.9% of the respondents still did not agree on this.

The handling of the Research and Development department in the organization was also analyzed. It was observed that the Research and Development in the organization was handled mainly internally with the response of almost 59.3% of the respondents. Only 12.5% of the respondents have expressed their views that the department was handled by an external center. 14.8% of the respondents have stated that the department might be carried by a consultant. Remaining 13.3% of the respondents found that the department was handled by others. Therefore, the major respondents concluded that the department was handled internally only.

The response on the handling of the technological vigilance by the organization was determined through statistical analysis. About 65.4% of the respondents agreed on the fact that the technological vigilance was handled by the organization and the remaining 34.6% of the respondents did not agree on this fact.

The incorporation of the number of new innovative technologies during the last 10 years was also analyzed. More than 5 new innovative technologies were incorporated during the last 10 years was the most responsive number highlighted by 51% of the respondents.

The adoption of the innovative idea in the concerned area was also determined. About 46% of the respondents responded for the adoption of the innovative idea in planning. 28.5 of the respondents showed response for the same in the area of marketing. 26.2% of them responded for the adoption in monitoring. Remaining 19.4 % of them adopted the innovative idea in the field of processing.

The response of the respondents for the role of innovative technology used in the growth of the organization. About 98.1% of the respondents expressed that the role of innovative technology used helped in growth of the organization.

The creativity regarding the organization was determined. It was observed that almost 50.2% of the respondents have expressed their views that the creativity was very high. Only 0.4% of the respondents agreed that the creativity was very low. Hence very high creativity was found regarding the same.

The monitoring, communication and mix strategy was also analyzed. It was observed that about 54.0% of the respondents expressed that the monitoring, communication, mix strategy was very high. Only 3% of the respondents expressed their views as very low.

The sales (negotiations and retailing) was analyzed through the statistical analysis by determining the variability as low, very low, medium, high and very high. Hence it was observed that about 39.2% of the respondents expressed that the sales (negotiations & Retailing) was very high. The low sales (negotiations & Retailing) was analyzed with the expression of 0.4% of the respondents only.

The packaging was also analyzed on the same variability. It was found that about 39.5% of the respondents expressed that the packaging was very high. 10.6% of the respondents expressed that the packaging was very low.

The product development and formulation were determined within the range of very low, low, medium, high and very high. Almost 40.3% of the respondents have expressed their response that the product development and formulation was very high. Only 3% of the respondents expressed their response that the product development and formulation was very low.

The business plan was also determined on the same basis. Hence it was observed that about 46.8% of the respondents expressed that the business plan was very high. 0.4% of the respondents expressed that the business plan was very low.

The project management was determined through the same statistical analysis. It was found that 56.3% of the respondents expressed that the project management was high. 0.4% were showing their expression regarding the project management to be very low.

Ethics and sustainability were equally important for determination. Hence it was determined that about 41.1% of the respondents expressed that the ethics & sustainability was found to be very high. Only 0.8% of the respondents expressed their response towards the ethics & sustainability to be very low.

The response towards the effect of intellectual capital on the strategic management decision making process of the organization was further determined. Hence it was observed that about 88.2% of the respondents have responded positively while the other 11.8% of the respondents have responded in a negative manner for the same.

The most important cross-cultural characteristics when it comes to the decision-

making process in the organization was analyzed. Certain factors were determined for the same that included corporate goals, feedback, objectivity of the decision-making process, promotional action taken before/ after the decision was made, cost benefit impact analysis of the decision. It was observed that almost 42.6% of the respondents found the objectivity of the decision-making process as the most important cross-cultural characteristics. 31.6% of the respondents agreed to the factor of cost benefit impact analysis of the decision. 27.4% of them favored the corporate goals. 20.5% of the respondents went with the feedback and the remaining 19.8% of them agreed for the promotional action taken before/ after the decision was made.

The response for the adoption of emerging innovative technology helped in enhancing knowledge and skills regarding the products of the organization was determined by the statistical analysis. It was found that about 64.3% of the respondents responded positively over the situation while the other 35.7% of the respondents responded with the negative response on the same.

The main obstacles to the organization while adopting the latest technology was analyzed. The obstacles included the reliability of the process of manufacturing, lack of specialized employees, reduced quality of the product, cost of the product and others. About 32.3% of the respondents expressed that reduced quality of product was found to be the main obstacle to the organization while adopting the latest technology. 27.8% of the respondents responded for the cost of the product as the obstacle. The reliability of the process of manufacturing was determined as the obstacle by 21.3% of the respondents. The lack of specialized employees was considered by 16% of the respondents as an obstacle. Other obstacles were considered by 5.7% of the respondents.

The response concerning the effect of the adoption of new technology on the organization's reputation was determined. It was observed that about 77.9% of the respondents were in the favour of the statement while other 22.1% of the respondents were against the statement.

The response for training associated with the latest technology having impact on the construction of project ideas as a social environment need was determined. Hence it was determined that almost 98.1% of the respondents have a positive response and only 1.9% of the respondents with negative response.

The response concerning the role of innovative technology helps in strategic performance management of the organization.

About 98.1% of the respondents expressed that, role of innovative technology help in strategic performance management of the organization.

## VI. CONCLUSION

### 6.1 Major Findings

The present study has helped in reaching the main objectives of the paper. The collected data of the study was present in the form of questionnaires which was further analyzed by using the tools such as ANOVA, Chi square test and SPSS software. These analyzed data have helped in obtaining the objective for the present study. The determination of the age group, gender analysis and designation of participants have helped in determining the organizational behaviour of the small and medium sized enterprises. The strategic decision making depended on the employees behaviour and their performance. The classification of the organizational sector and the availability of the Research and Development department has also contributed in the analysis. The respondents' analysis on dedication of the organization's staffs towards the adoption of the new technology has evolved the enhancement of the knowledge and skills of the staff, providing them competitive advantage for real-time decision making. The respondents have also responded towards the handling of technological vigilance by the organization in a positive manner which has evolved the strategic decision making and performance improvement of the SMEs. The respondents' analysis on the incorporation of the innovative technologies along with the adoption of the innovative ideas have affected the working factors of the small and medium sized enterprises. The innovative idea of planning was most common among the respondents in the given study which has evolved the production of innovative products by the use of technological advancements. This further helps in enhancing the performance and growth of the SMEs. The response of the respondents for the role of innovative technology used in the growth of the organization was found to be very high which eventually proves the efficiency of the performance outcome and strategic development of the SMEs. The response of the respondents towards the effect of intellectual capital like human capital, relational capital, structural capital on the strategic management decision making process of the organization was analysed to be positive in the present study which implicates technology's role in facilitating the strategic performance management. Among all the factors of decision making of the organization, the objectivity of the decision-making process was

found to be the most important cross-cultural characteristics. The positive response of the respondents for the adoption of emerging innovative technology helped in enhancing knowledge and skills regarding the products of the organization. The statistical analysis on analyzing the management functions, structural transformations, competition, socio-economic functions, marketing, operations, strategic focus (leadership, team building, planning) has determined the role of rapid technological change and its relationship between technology a major strategic factor for many organizations. The elements of technological usage in working culture and internal working system of SMEs in the given study involves the creativity, monitoring, communication and mix strategy, sales (negotiations and retailing), packaging, product development and formulation, business plan, project management and ethics and sustainability. These have evolved the determination of the hypothesis in present study and the Chi square test on these variables are performed for obtaining the relationship among the variables.

## 6.2 Recommendations

The analysis and findings of this study has involved the adoption of the innovative idea and other implementation of the organizations for enhancing the performance that have helped in understanding the role of technology in strategic decision making and performance outcome in small and medium sized enterprises. The findings in the study have suggested that certain technological elements can be implemented in the organization for the development of industry and economy. These innovative ideas and technological elements can be promoted as sustainable advancements that would further help in creating a conducive work environment. This would evolve the SMEs for the production of products of higher value adding competitive strategies. This will evolve profit in the market of the competitive business. The findings related to the effects of the intellectual capital on the strategic management decision making process of the organization may help the SMEs in the reduction of the transaction cost along with the lowering of the promotional and marketing cost. This would also allow in improving the communication and interaction with the customers. The availability and handling of the Research and Development department would contribute in the development of different channels related to management and decision making within the organizations. This may lessen the burden of the organization for work coordination. The findings in

the study related to the innovative idea have mostly been implemented on proper planning about the business development. This innovative idea of planning involving the workers and the employees may boost up the efficiency regarding the work performance so that better services are provided to the customers and the clients by innovating the development of innovative products and meeting the demands of the customers. The study has also encouraged the top management employees to participate in enhancing the work performance and making an effective contribution towards the organization's system. The managers should cooperate with the system and should be aware of all the managerial functions and changes for more efficient performance outcomes. One of the most important roles of technology in the small and medium sized enterprises is to enhance the strategic decision-making process that should be improved for developing effective communication channels for the professionals and the management. The good communication among the professionals helps in developing appropriate information regarding the work efficiency of the organization which would mold the system design in a better way. The organization should always be aware regarding the principles and functions in which the recommendations are implemented so that the efficiency in the performance is maintained along with other developments. The results of the given study have involved the confirmation of the implementation of innovation technology on the small and medium enterprises. The given study needs to be more specified and extended by involving more framework and analysis of multiple relationships for innovation technology in the SMEs. The important innovations can be highlighted for future studies. The longitudinal analysis on the innovation technology in the organizations are recommended. This analysis may involve the adoption of innovation technology in the organizations by improving the performance outcome and enhancing the strategic decision-making process.

## 6.3 Limitations

The study involves many limitations. First, the findings of the given study must have been interpreted more with the research development concerning the structural and social capital which is missing in the study. Many studies have evolved the fact that the structural social capital of the managers was rich regarding the structural holes, it still had differences in the range with negative emotions and bridge in relationship with other organizations. This has brought into the decision of

recommending the effects of cross-cultural validation as no such requirement is implemented in this research.

Second, the detailed survey regarding the role of technology among the organizations has not been fully elaborated in the research giving less relevance to the strategies and outcomes which may lead to improper understanding of the technology role in the organizations at a wider range. This may also affect the strategic decision-making role and work performance of the organizations.

Third, the circumstances due to the adoption of new technology in the small and medium enterprises. The factors such as requirement of initial capital, lack of skilled labor, the implementation of appropriate strategies for utilization of the technology, lack of the desired information and some more uncertainties are noted. These scenarios sometimes lead to problems in the adoption. The finding of this study has also revealed that the product quality is reduced when the new technology is adopted initially. Hence the adoption of new technology may be problematic sometimes.

Fourth, the advancements in small and medium enterprises may cause impact on the performance of organizations. These advancements are compelled by some factors such as the accessibility of adopting towards the appropriate technology, the restriction in accession to the global market, the implementation of the rules, laws and regulations affecting the improvement of the work performance in different sectors, the lack of training and administrative facilities and the financial support. These are some of the factors that may limit the performance ability in the organizations.

Fifth, the given research study is based on quantitative and deductive approach and has provided many results that may be collected and diversified in different contexts. This leads to limiting the research approach offering good opportunities for the future.

#### **6.4 Future Research**

Future research for understanding the role of technology in strategic decision making and performance outcomes in small and medium enterprises has been proved to be an essential objective. The implementation of the cognitive factors for better understanding of the role of technology in SMEs will provide better impact on the performance outcome among different organizations. This will involve the processing of intra and inter individual cues leading to the improved work performance in the organizations.

The analysis and result of the given study has involved the better understanding of the strategic decision making along with the improved performance by the implementation of the innovative ideas and skills as compared to the other large firms. This makes a path towards more development in future. This can be further used for more work to be compelled in the organization in coming future.

The present study has involved the fact that the intellectual capital of the organization depends on the processing of the business abilities along with the involvement of internal parties contributing for handling and executing the decision which is conducive and implements positive effects on SMEs. This relation can be further extended and utilized in other smaller firms so that the performance outcome is improved, providing profits in the business in future.

The present study has also utilized different factors and variables for identifying the influences on strategic decision making and suggesting the implementation of more innovative technology to enhance the economy. The contribution of the employees and workers in the adoption and implementation of new and innovative technology have laid the foundation for understanding the role of technology and its effects on the growth and performance of the business in the organization. More factors can be implemented by the employees and workers to understand the role of technology in future studies so that the process of decision making in the organizations reveals its actual relevance without any drawback and other explanation.

The present study has not involved the effects of financial resources for daily operations in the organizations. Therefore, future study on the involvement of financial resources must be represented to strengthen the competitiveness among the different organizations. The large-scale use of technology involves more financial support for adoption and development of innovative and new technology so that the strategic decision making and performance outcome is enhanced as a result of improved economy and profit in the business.

The influencing internal factors have been involved for enhancing the performance of the organization. The internal factors consist of the organization management, organizational characteristics, employees and workers working for the organization, resources and handling and management of such resources in the organization. The study has not involved the elaboration of the factors for adopting the new technology. This issue

can be further addressed in the future study where the factors and resources for adopting concepts need to be highlighted at a larger scale.

This study may not have covered all the role of technology in small and medium enterprises along with other major characteristics of the organizations and its situations for implementing innovative ideas of technology that would benefit the organization and deal with the issues related to technology within the organization. Therefore, different frameworks can be utilized in future for the same.

### APPENDIX

#### SURVEY QUESTIONNAIRE:

Gender:

Age:

Designation:

1) How many members are working in this organization?

- a) Below 100
- b) 100 - 250
- c) 250- 500
- d) More than 500

2) In which sector is your organization classified in?

- a) FMCG
- b) Manufacturing
- c) IT
- d) Automobiles
- e) Others, please specify: \_\_\_\_\_

3) Is there any Research and Development department in your company?

- a) Yes
- b) No
- c) If yes, how many people: \_\_\_\_\_

4) Is the organization staff dedicated towards new innovative technology?

- a) Yes
- b) No

5) How is the Research and Development department handled in your organization?

- a) Internally
- b) By an external laboratory
- c) By a consultant
- d) By an external center
- e) Others

6) Are the technological vigilance handled by the organization?

- a) Yes
- b) No

7) During the last 10 years, how many new innovative technologies have been incorporated in the organization?

- a) Zero
- b) 1

c) 2 to 5

d) More than 5

8) In which area is the innovative idea adopted?

- a) Marketing
- b) Processing
- c) Monitoring
- d) Planning

9) Does the role of innovative technology used help in the growth of the organization?

- a) Yes
- b) No

10) In the case of innovative technology, assess the skills that are found in the employees of the organization.

i. Creativity

- a) Very Low
- b) Low
- c) Medium
- d) High
- e) Very High

ii. Marketing Strategy: monitoring, communication, mix strategy,...

- a) Very Low
- b) Low
- c) Medium
- d) High
- e) Very High

iii. Sales: negotiation and retailing

- a) Very Low
- b) Low
- c) Medium
- d) High
- e) Very High

iv. Packaging

- a) Very Low
- b) Low
- c) Medium
- d) High
- e) Very High

v. Product development and formulation

- a) Very Low
- b) Low
- c) Medium
- d) High
- e) Very High

vi. Business plan

- a) Very Low
- b) Low
- c) Medium
- d) High
- e) Very High

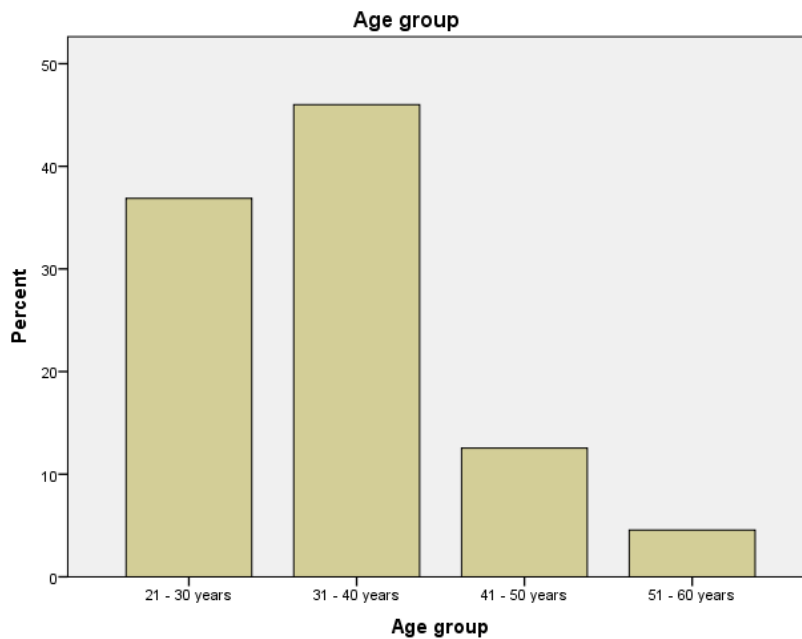
- vii. Project Management
- a) Very Low
  - b) Low
  - c) Medium
  - d) High
  - e) Very High
- viii. Ethics and sustainability
- a) Very Low
  - b) Low
  - c) Medium
  - d) High
  - e) Very High
- 11) Is there any effect of intellectual capital like human capital, relational capital, structural capital on the strategic management decision making process of the organization?
- a) Yes
  - b) No
- 12) Which of the following are the most important cross-cultural characteristics when it comes to decision making process in the organization?
- a) Corporate goals
  - b) Feedback
  - c) Objectivity of the decision-making process.
  - d) Promotional action taken before/after decision is made.
  - e) Cost benefit impact analysis of the decision.
- 13) Does adopting emerging innovative technology helps in enhancing knowledge and skills regarding the products of the organization?
- a) Yes
  - b) No
- 14) What do you think are the main obstacles to the organization while adopting the latest technology?
- a) Reliability of the process of manufacturing
  - b) Lack of specialized employees
  - c) Reduced quality of the product
  - d) Cost of the product
  - e) Others, please specify: \_\_\_\_\_
- 15) Is there an effect of adoption of new technology on the organization's reputation?
- a) Yes
  - b) No
- 16) Does training associated with the latest technology have an impact on the construction of project ideas as a social environment need?
- a) Yes
  - b) No
- 17) Does the role of innovation technology help in strategic performance management of the organization?
- a) Yes
  - b) No
  - c) If yes, please in which manner: \_\_\_\_\_
- 18) On which of the factors, does the rapid change in the technology or techniques has its effect?
- a) Management functions
  - b) Structural transformations
  - c) Competition
  - d) Socio-economic functions
  - e) Marketing
  - f) Operations
  - g) Strategic Focus ( leadership, team building, planning)

**SURVEY OUTCOMES:**

1) **Age:** From the following table we can observe that, about 46.0% of the respondents were aged between 31 – 40 years. Following bar chart also shows taller bar corresponding to the same.

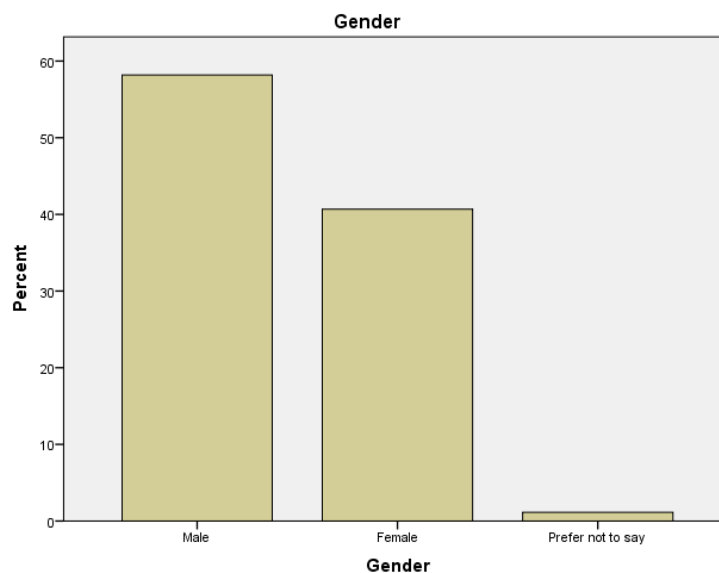
Age group				
	Frequency	Percent	Valid Percent	Cumulative Percent
	21 - 30 years	97	36.9	36.9
	31 - 40 years	121	46.0	82.9
Valid	41 - 50 years	33	12.5	95.4
	51 - 60 years	12	4.6	100.0
	Total	263	100.0	100.0





2) **Gender:** From the following table we can observe that, about 58.2% of the respondents were males. Following bar chart also shows taller bar corresponding to the same.

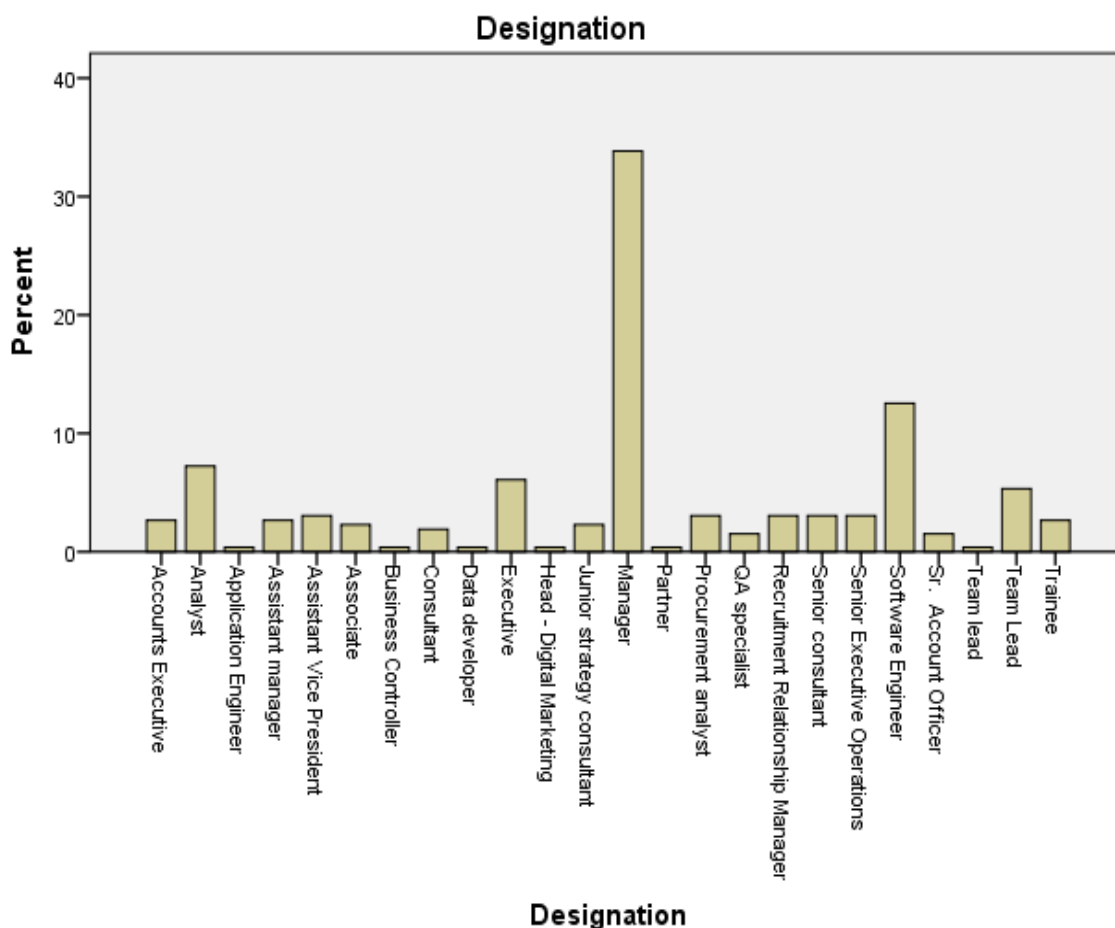
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	153	58.2	58.2	58.2
	Female	107	40.7	40.7	98.9
	Prefer not to say	3	1.1	1.1	100.0
	Total	263	100.0	100.0	



3) **Designation:** From the following table we can observe that, about 33.8% of the respondents were managers. Following bar chart also shows taller bar corresponding to the same.

**Designation**

	Frequency	Percent	Valid Percent	Cumulative Percent
Accounts Executive	7	2.7	2.7	2.7
Analyst	19	7.2	7.2	9.9
Application Engineer	1	.4	.4	10.3
Assistant manager	7	2.7	2.7	12.9
Assistant Vice President	8	3.0	3.0	16.0
Associate	6	2.3	2.3	18.3
Business Controller	1	.4	.4	18.6
Consultant	5	1.9	1.9	20.5
Data developer	1	.4	.4	20.9
Executive	16	6.1	6.1	27.0
Head - Digital Marketing	1	.4	.4	27.4
Junior strategy consultant	6	2.3	2.3	29.7
Manager	89	33.8	33.8	63.5
Valid Partner	1	.4	.4	63.9
Procurement analyst	8	3.0	3.0	66.9
QA specialist	4	1.5	1.5	68.4
Recruitment Relationship Manager	8	3.0	3.0	71.5
Senior consultant	8	3.0	3.0	74.5
Senior Executive Operations	8	3.0	3.0	77.6
Software Engineer	33	12.5	12.5	90.1
Sr. Account Officer	4	1.5	1.5	91.6
Team lead	1	.4	.4	92.0
Team Lead	14	5.3	5.3	97.3
Trainee	7	2.7	2.7	100.0
Total	263	100.0	100.0	



**4) How many members are working in your organization?**

From the following table we can observe that, about 57.0% of the respondents expressed that above 500 workers were working in their organization. Following bar chart also shows taller bar corresponding to the same.

**How many members are working in your organization?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Below 100	23	8.7	8.7	8.7
100-250	41	15.6	15.6	24.3
Valid 250-500	49	18.6	18.6	43.0
Above 500	150	57.0	57.0	100.0
Total	263	100.0	100.0	

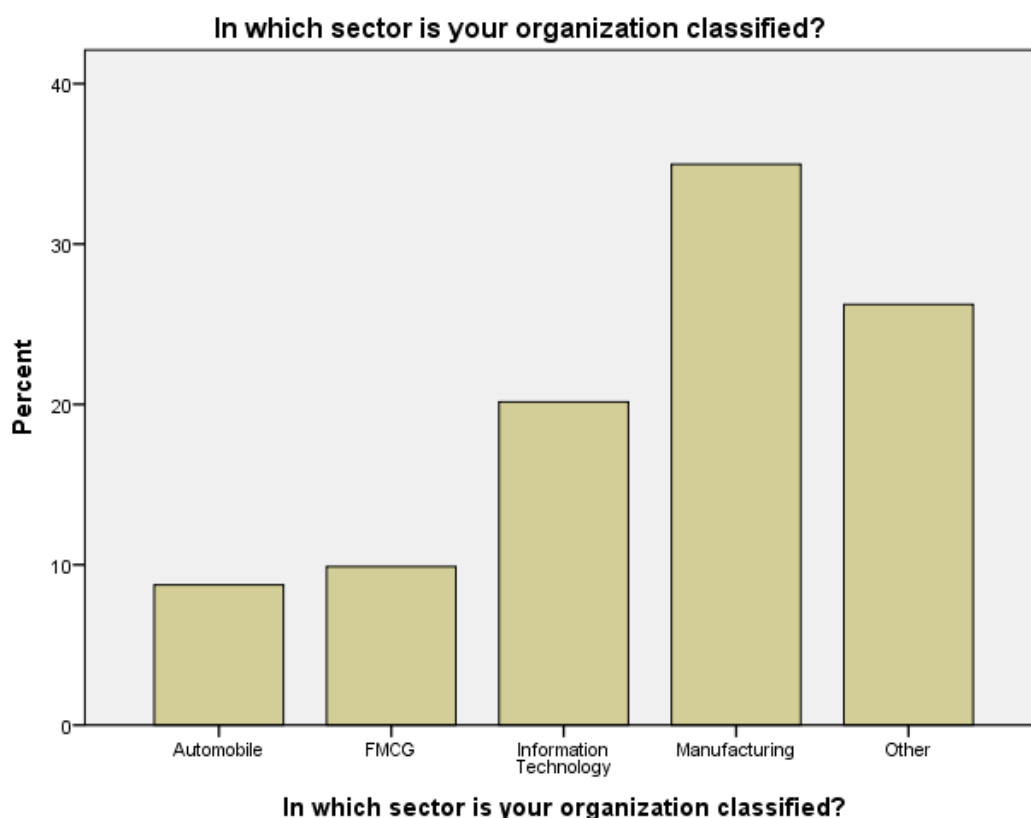


**5) In which sector is your organization classified?**

From the following table we can observe that, about 35.0% of the respondents expressed that their organization is classified with manufacturing. Following bar chart also shows taller bar corresponding to the same.

**In which sector is your organization classified?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Automobile	23	8.7	8.7	8.7
Valid FMCG	26	9.9	9.9	18.6
Valid Information Technology	53	20.2	20.2	38.8
Valid Manufacturing	92	35.0	35.0	73.8
Valid Other	69	26.2	26.2	100.0
Total	263	100.0	100.0	

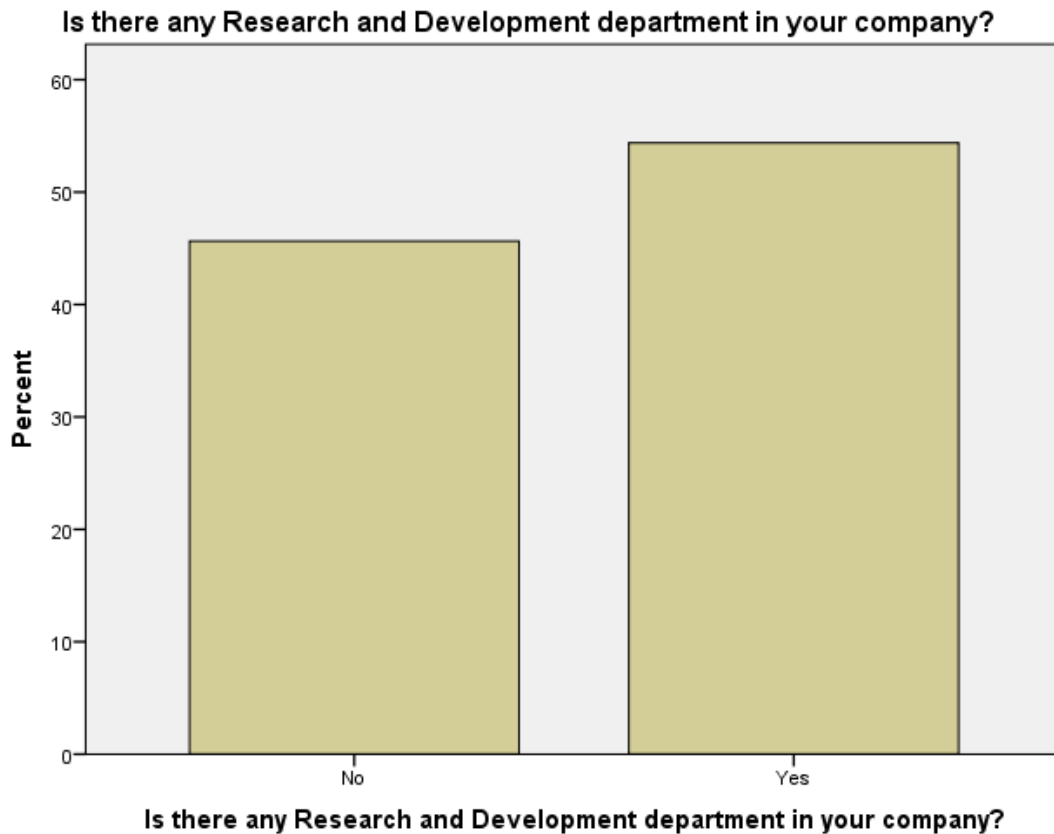


**6) Is there any Research & Development department in your company?**

From the following table we can observe that, about 54.4% of the respondents expressed that there is research and development department in their company. Following bar chart also shows taller bar corresponding to the same.

**Is there any Research and Development department in your company?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	120	45.6	45.6	45.6
Valid Yes	143	54.4	54.4	100.0
Total	263	100.0	100.0	

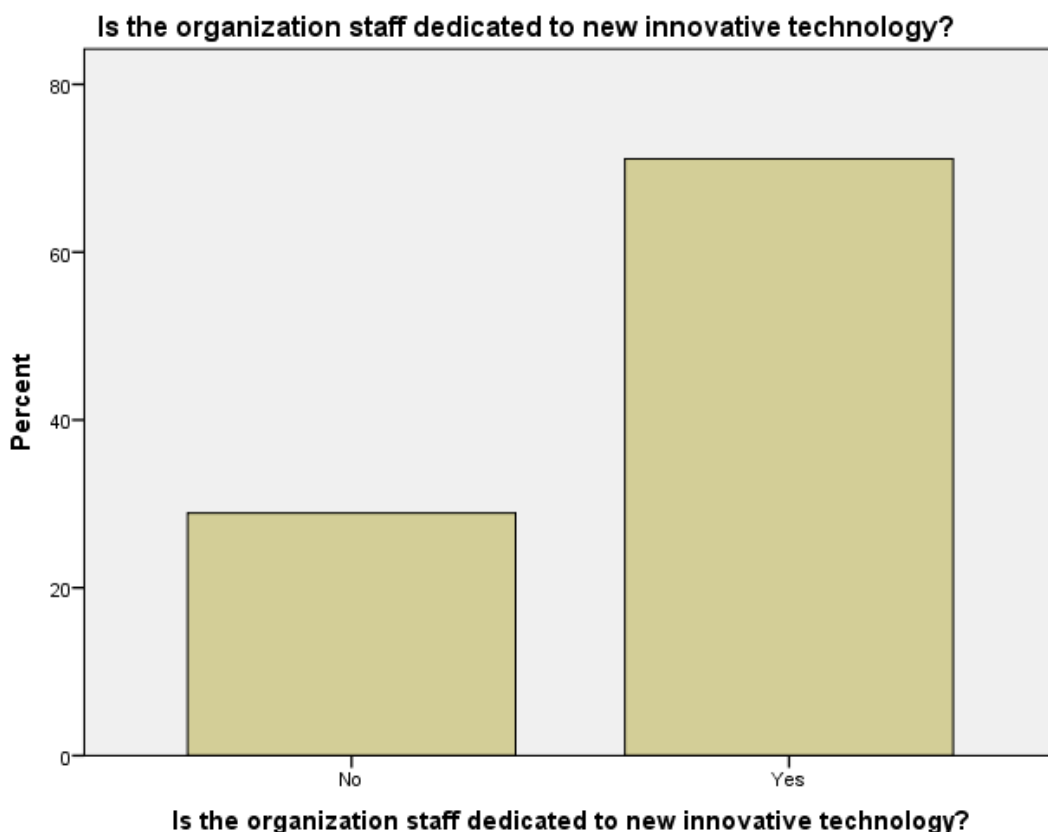


**7) Is the organization staff dedicated to new innovative technology?**

From the following table we can observe that, about 71.1% of the respondents expressed that, the organization staff are dedicated to new innovative technology. Following bar chart also shows taller bar corresponding to the same.

**Is the organization staff dedicated to new innovative technology?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	76	28.9	28.9	28.9
Valid Yes	187	71.1	71.1	100.0
Total	263	100.0	100.0	

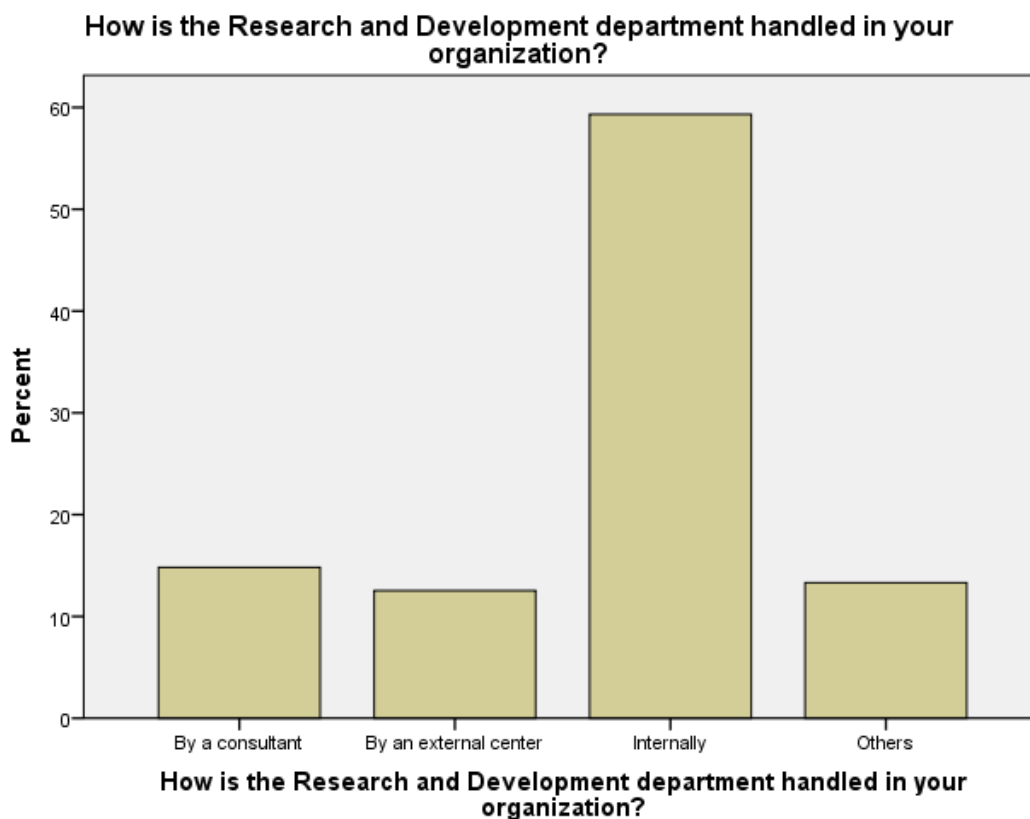


**8) How is the Research and Development department handled in your organization?**

From the following table we can observe that, about 59.3% of the respondents expressed that, the research and development department handled in their organization internally. Following bar chart also shows taller bar corresponding to the same.

**How is the Research and Development department handled in your organization?**

	Frequency	Percent	Valid Percent	Cumulative Percent
By a consultant	39	14.8	14.8	14.8
By an external center	33	12.5	12.5	27.4
Valid Internally	156	59.3	59.3	86.7
Others	35	13.3	13.3	100.0
Total	263	100.0	100.0	



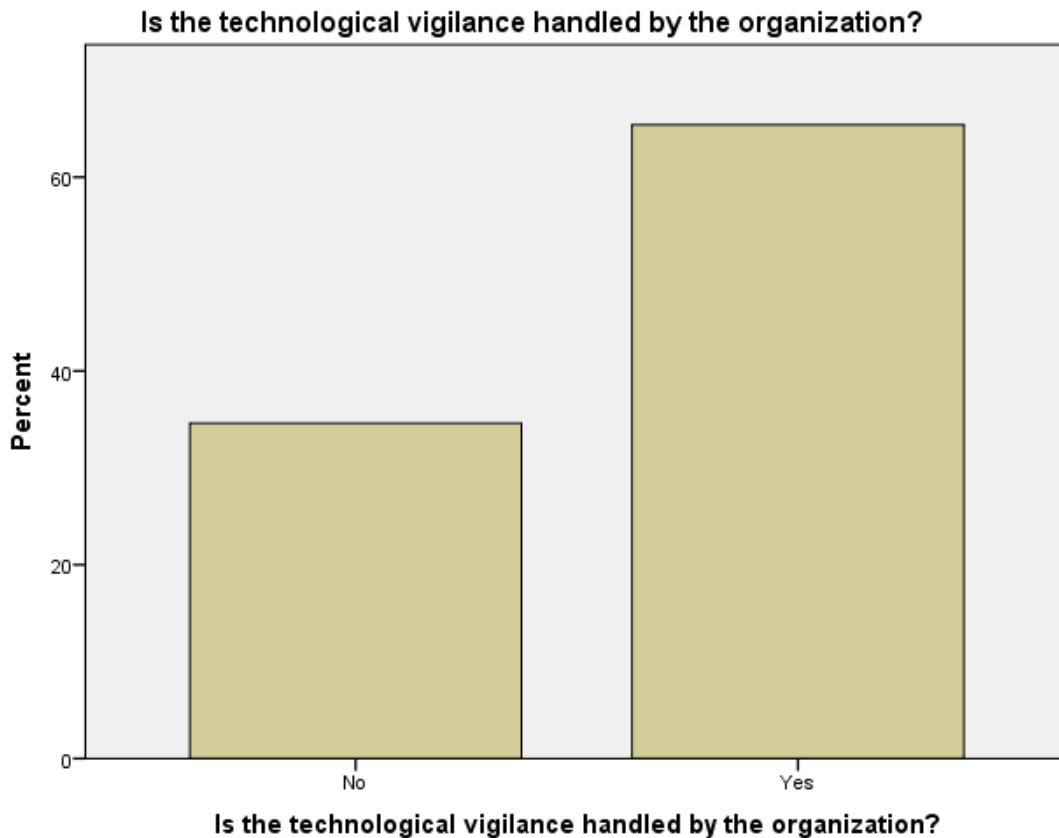
**9) Is the technological vigilance handled by the organization**

From the following table we can observe that, about 65.4% of the respondents expressed that, technological vigilance handled by the organization. Following bar chart also shows taller bar corresponding to the same.

**Is the technological vigilance handled by the organization?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	91	34.6	34.6	34.6
Valid Yes	172	65.4	65.4	100.0
Total	263	100.0	100.0	





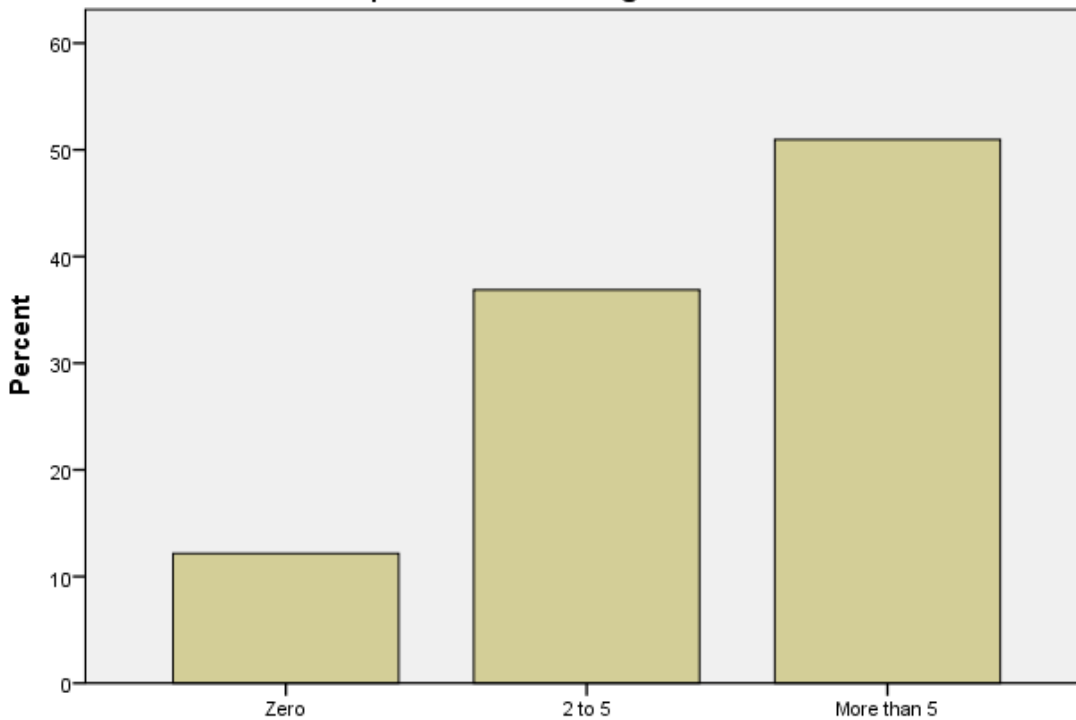
**10) During the last 10 years, how many new innovative technologies have been incorporated into the organization?**

From the following table we can observe that, about 51.0% of the respondents expressed that, during the last 10 years, more than 5 new innovative technologies have been incorporated into the organization. Following bar chart also shows taller bar corresponding to the same.

**During the last 10 years, how many new innovative technologies have been incorporated into the organization?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Zero	32	12.2	12.2	12.2
Valid 2 to 5	97	36.9	36.9	49.0
Valid More than 5	134	51.0	51.0	100.0
Total	263	100.0	100.0	

**During the last 10 years, how many new innovative technologies have been incorporated into the organization?**



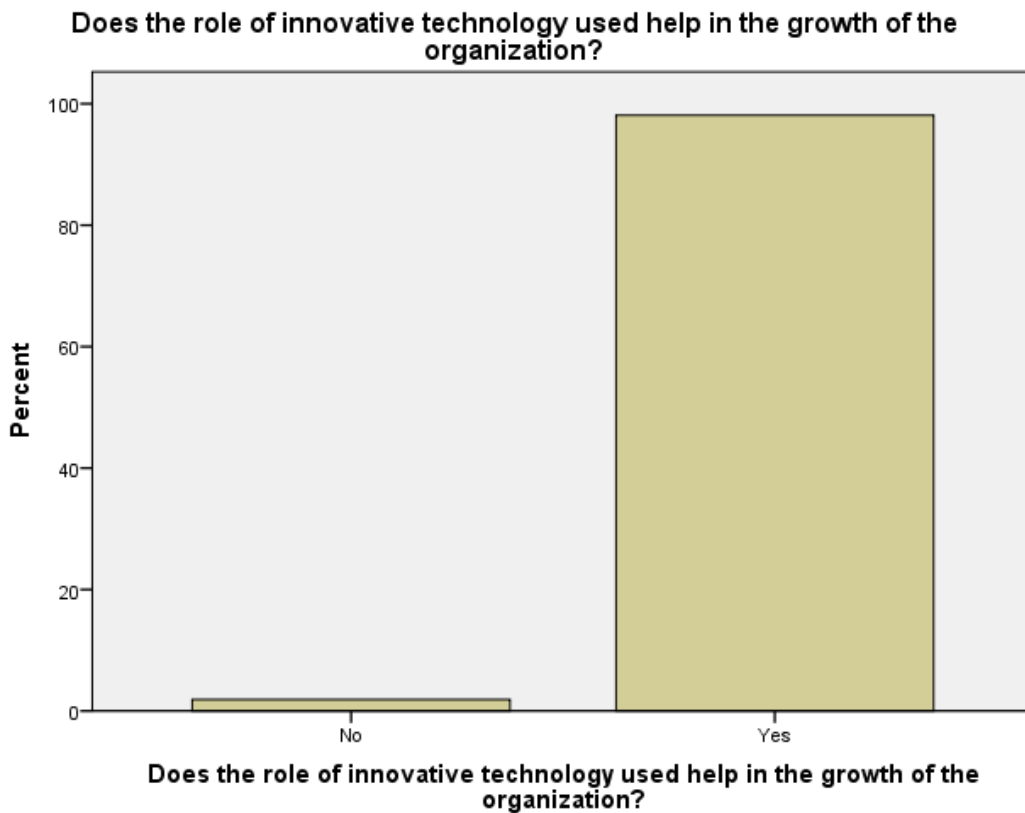
**During the last 10 years, how many new innovative technologies have been incorporated into the organization?**

**11) Does the role of innovative technology used help in the growth of the organization?**

From the following table we can observe that, about 98.1% of the respondents expressed that, the role of innovative technology used help in growth of the organization. Following bar chart also shows taller bar corresponding to the same.

**Does the role of innovative technology used help in the growth of the organization?**

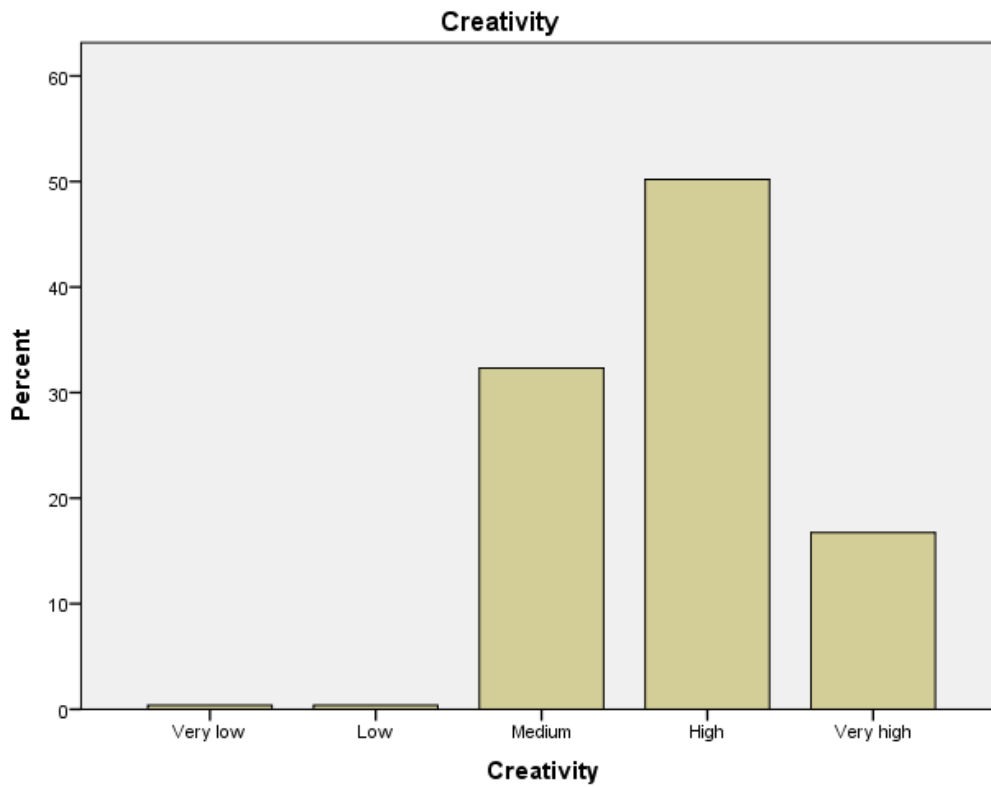
	Frequency	Percent	Valid Percent	Cumulative Percent
No	5	1.9	1.9	1.9
Valid Yes	258	98.1	98.1	100.0
Total	263	100.0	100.0	



**12) Creativity:** From the following table we can observe that, about 50.2% of the respondents expressed that, the creativity is very high. Following bar chart also shows taller bar corresponding to the same.

**Creativity**

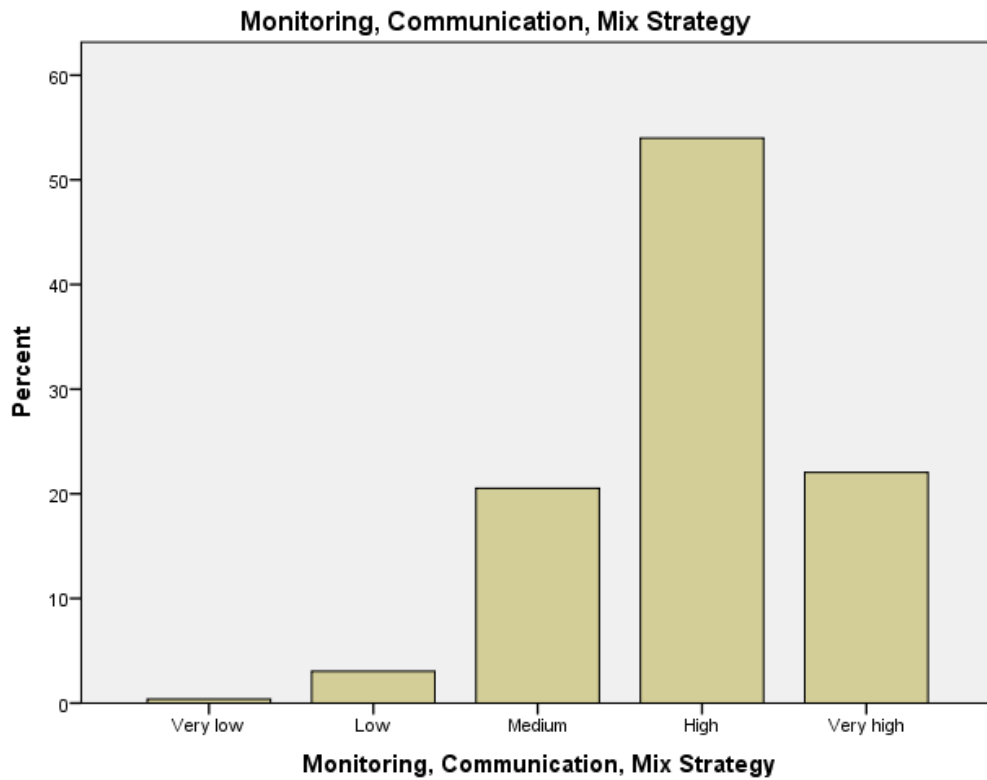
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very low	1	.4	.4
	Low	1	.4	.8
	Medium	85	32.3	32.3
	High	132	50.2	83.3
	Very high	44	16.7	100.0
	Total	263	100.0	100.0



**13) Monitoring, Communication, Mix Strategy:** From the following table we can observe that, about 54.0% of the respondents expressed that, the monitoring, communication, mix strategy is very high. Following bar chart also shows taller bar corresponding to the same.

**Monitoring, Communication, Mix Strategy**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very low	1	.4	.4	.4
Valid Low	8	3.0	3.0	3.4
Valid Medium	54	20.5	20.5	24.0
Valid High	142	54.0	54.0	77.9
Valid Very high	58	22.1	22.1	100.0
Total	263	100.0	100.0	



**14) Sale (Negotiations & Retailing):** From the following table we can observe that, about 39.2% of the respondents expressed that, the sales (negotiations & Retailing) is very high. Following bar chart also shows taller bar corresponding to the same.

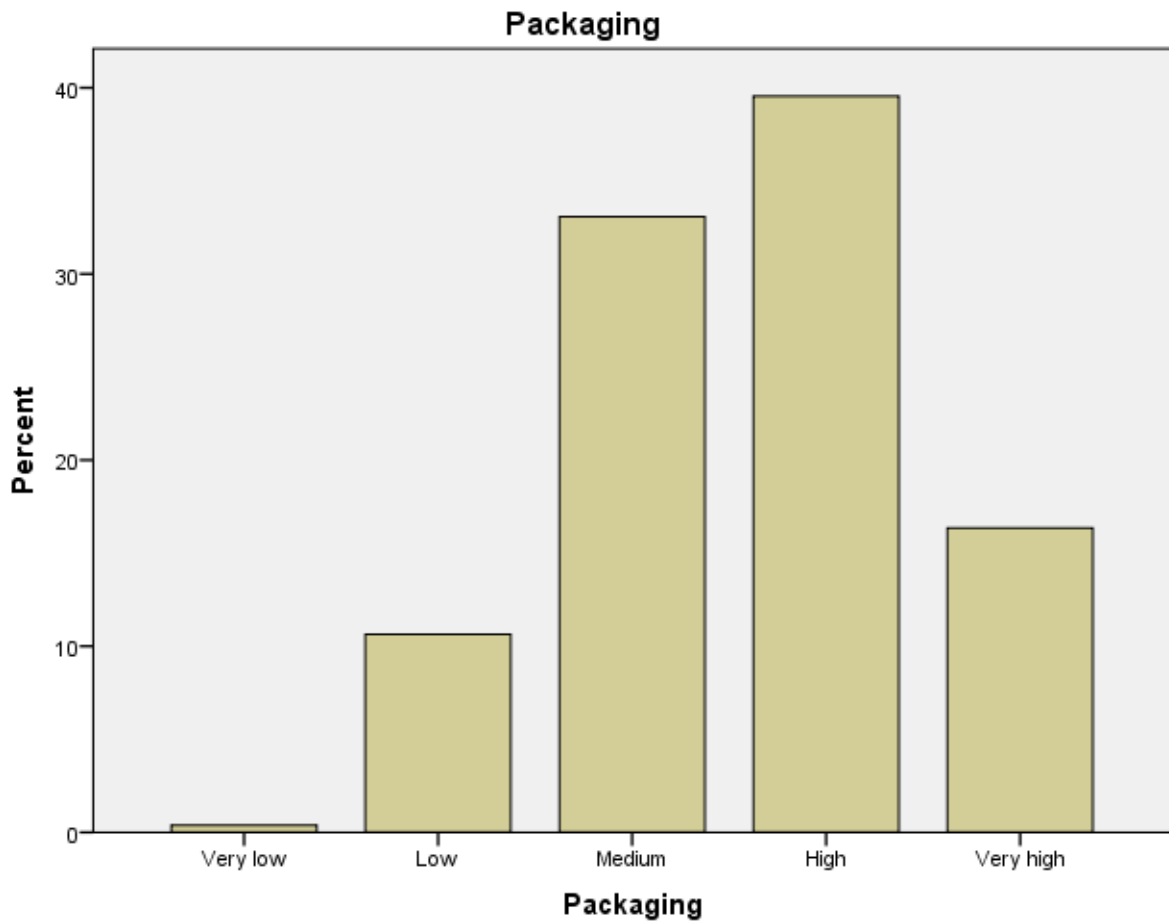
**Sales (Negotiations & Retailing)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Very low	1	.4	.4	.4
Low	1	.4	.4	.8
Valid Medium	98	37.3	37.3	38.0
Valid High	103	39.2	39.2	77.2
Valid Very high	60	22.8	22.8	100.0
Total	263	100.0	100.0	



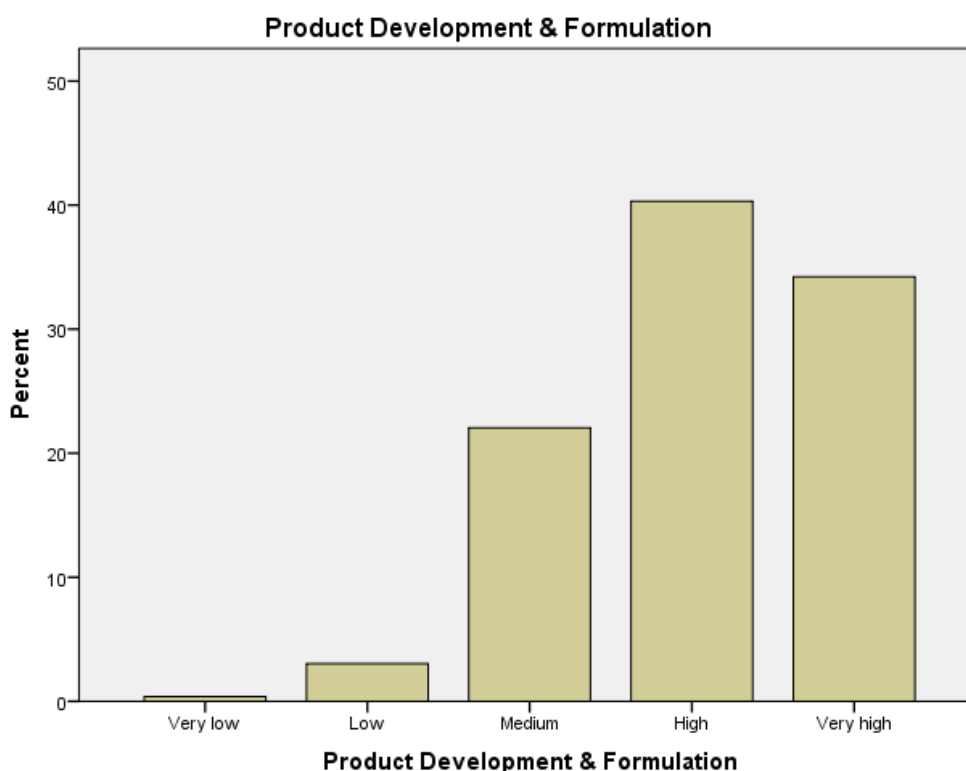
**15) Packaging:** From the following table we can observe that, about 39.5% of the respondents expressed that, the packaging is very high. Following bar chart also shows taller bar corresponding to the same.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very low	1	.4	.4	.4
Valid Low	28	10.6	10.6	11.0
Valid Medium	87	33.1	33.1	44.1
Valid High	104	39.5	39.5	83.7
Valid Very high	43	16.3	16.3	100.0
Total	263	100.0	100.0	



**16) Product Development & Formulation:** From the following table we can observe that, about 40.3% of the respondents expressed that, the product development & formulation is very high. Following bar chart also shows taller bar corresponding to the same.

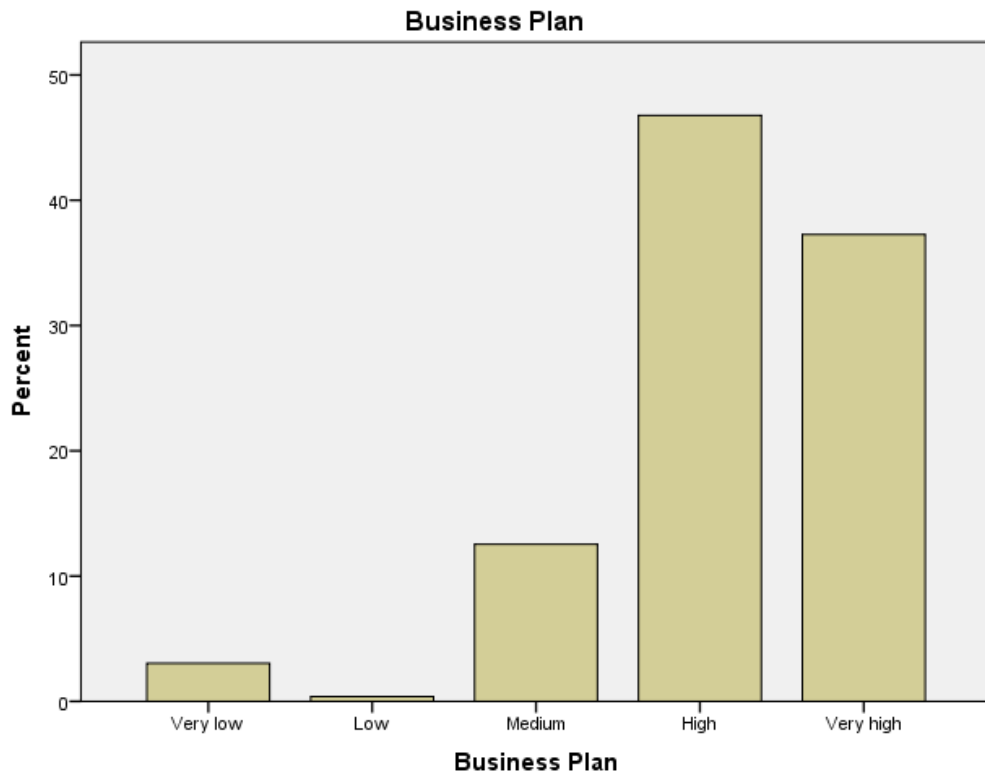
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very low	1	.4	.4	.4
Valid Low	8	3.0	3.0	3.4
Valid Medium	58	22.1	22.1	25.5
Valid High	106	40.3	40.3	65.8
Valid Very high	90	34.2	34.2	100.0
Total	263	100.0	100.0	



**17) Business Plan:** From the following table we can observe that, about 46.8% of the respondents expressed that, the business plan is very high. Following bar chart also shows taller bar corresponding to the same.

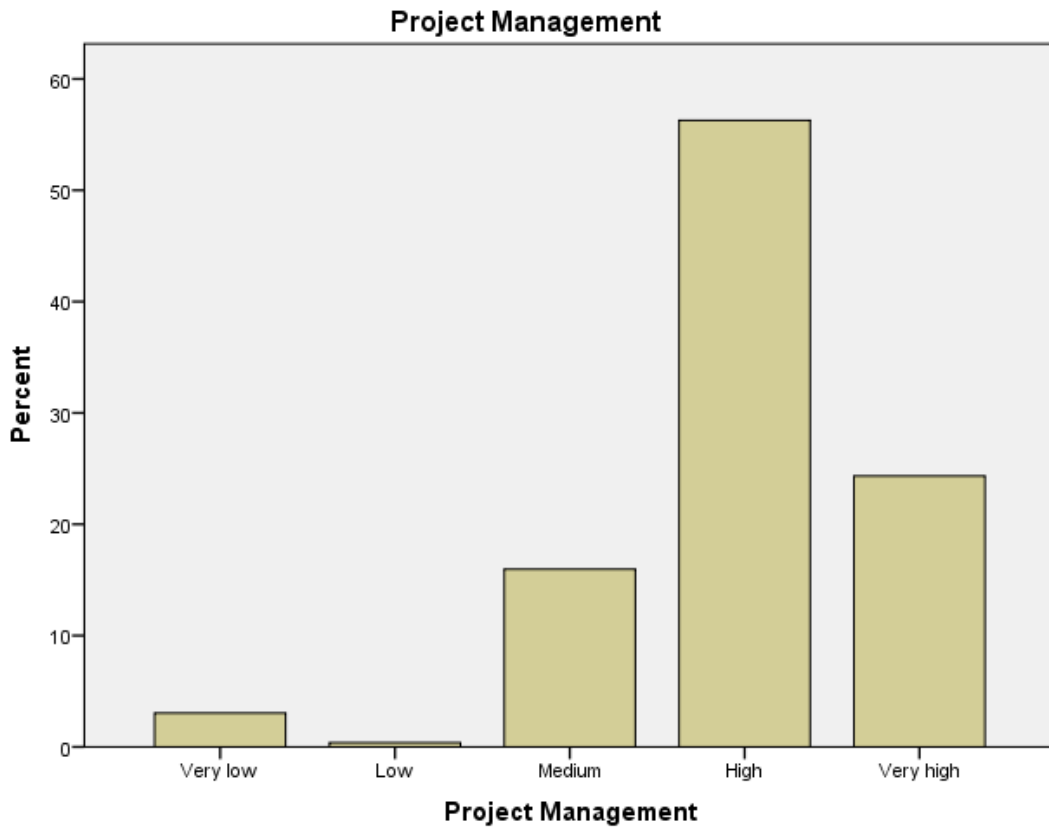
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very low	8	3.0	3.0
	Low	1	.4	3.4
	Medium	33	12.5	16.0
	High	123	46.8	62.7
	Very high	98	37.3	100.0
	Total	263	100.0	100.0





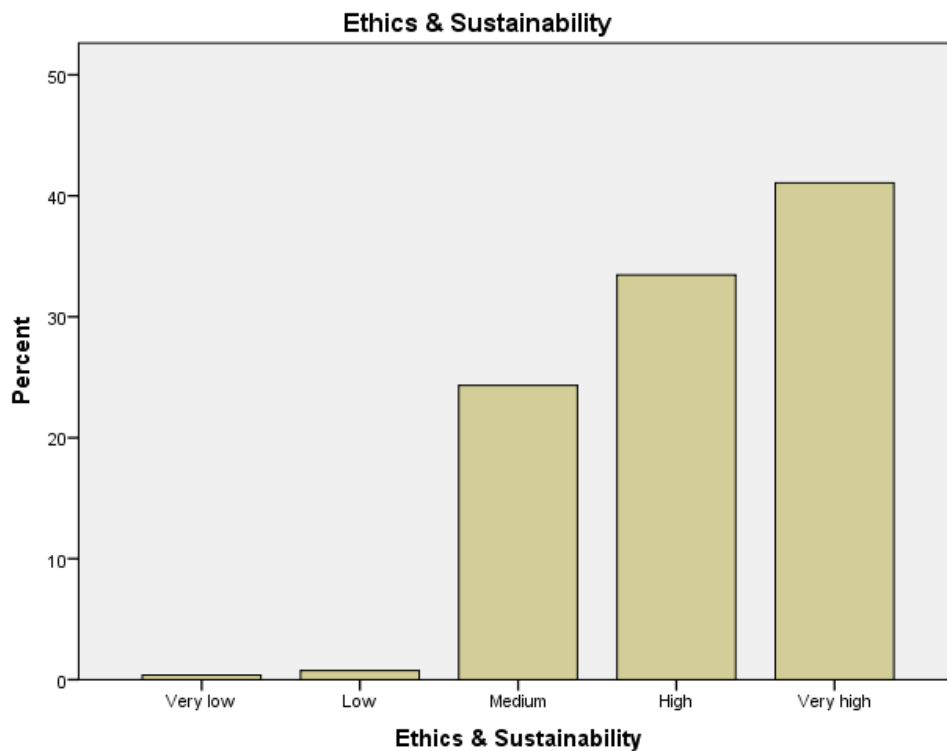
**18) Product Management:** From the following table we can observe that, about 56.3% of the respondents expressed that, the project management is high. Following bar chart also shows taller bar corresponding to the same.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very low	8	3.0	3.0
	Low	1	.4	3.4
	Medium	42	16.0	19.4
	High	148	56.3	75.7
	Very high	64	24.3	100.0
	Total	263	100.0	100.0



**18) Ethics & Sustainability:** From the following table we can observe that, about 41.1% of the respondents expressed that, the ethics & sustainability is very high. Following bar chart also shows taller bar corresponding to the same.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very low	1	.4	.4	.4
Low	2	.8	.8	1.1
Medium	64	24.3	24.3	25.5
High	88	33.5	33.5	58.9
Very high	108	41.1	41.1	100.0
Total	263	100.0	100.0	



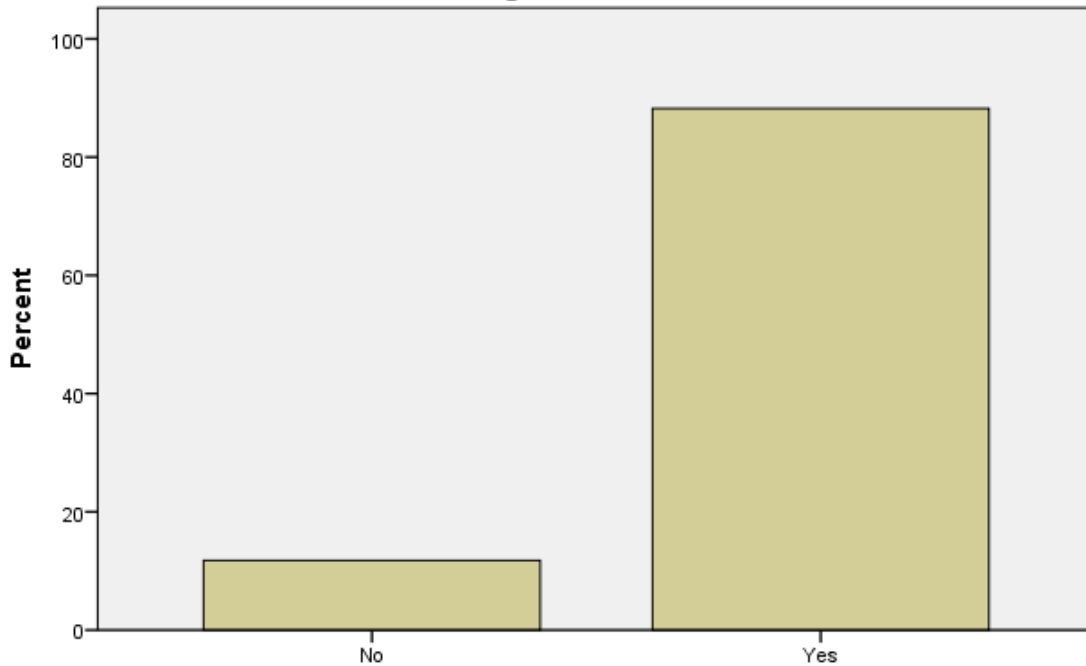
**19) Is there any effect of intellectual capital like human capital, relational capital, structural capital, on the strategic management decision making the process of organization?**

From the following table we can observe that, about 88.2% of the respondents expressed that, there is any effect of intellectual capital like human capital, relational capital, structural capital, on the strategic management decision making the process of organization. Following bar chart also shows taller bar corresponding to the same.

**Is there any effect of intellectual capital like human capital, relational capital, structural capital on the strategic management decision making the process of the organization?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	31	11.8	11.8	11.8
Valid Yes	232	88.2	88.2	100.0
Total	263	100.0	100.0	

**Is there any effect of intellectual capital like human capital, relational capital, structural capital on the strategic management decision making the process of the organization?**



**Is there any effect of intellectual capital like human capital, relational capital, structural capital on the strategic management decision making the process of the organization?**

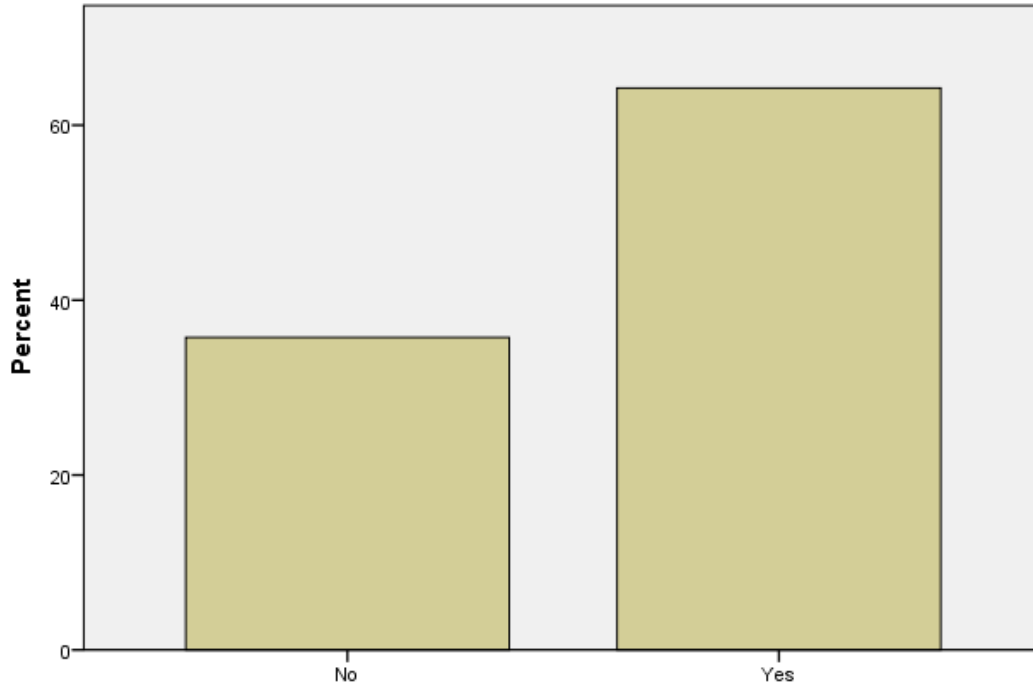
**20) Does adopting emerging innovative technology helps in enhancing knowledge and skills regarding the products of the organization?**

From the following table we can observe that, about 64.3% of the respondents expressed that, they adopt emerging innovative technology helps in enhancing knowledge and skills regarding the products of the organization. Following bar chart also shows taller bar corresponding to the same.

**Does adopt emerging innovative technology helps in enhancing knowledge and skills regarding the products of the organization?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	94	35.7	35.7	35.7
Valid Yes	169	64.3	64.3	100.0
Total	263	100.0	100.0	

**Does adopt emerging innovative technology helps in enhancing knowledge and skills regarding the products of the organization?**



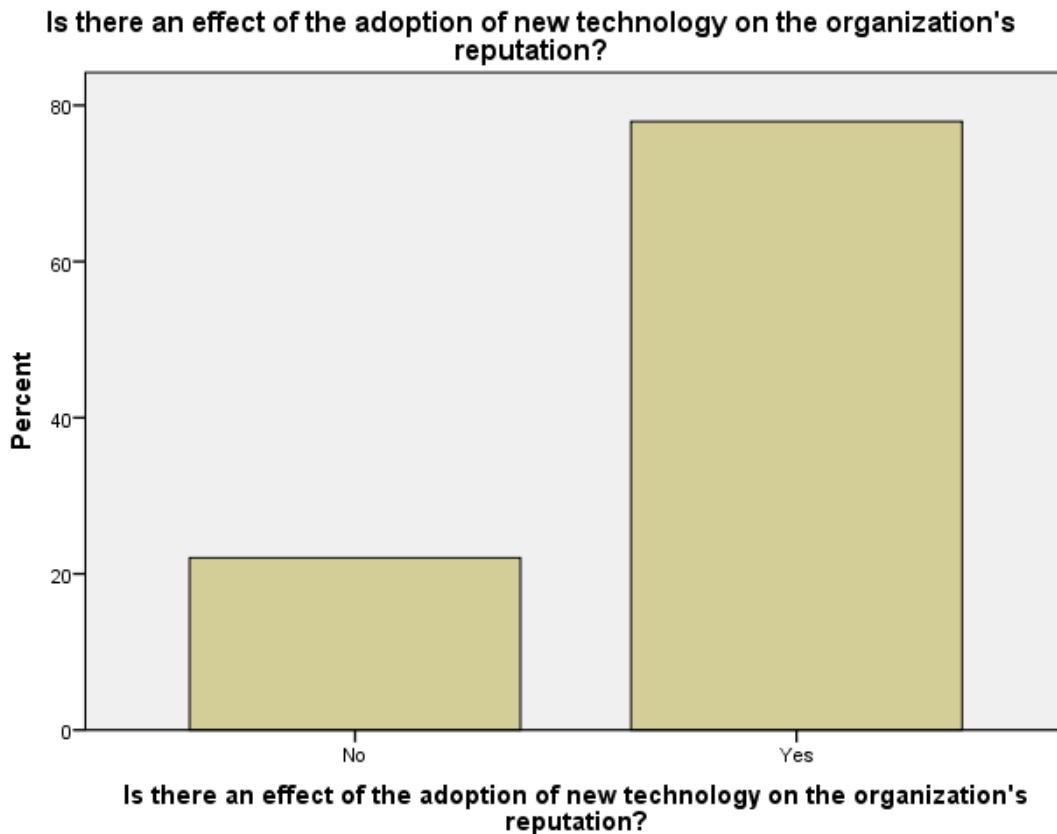
**Does adopt emerging innovative technology helps in enhancing knowledge and skills regarding the products of the organization?**

**21) Is there an effect of the adoption of new technology on the organization’s reputation?**

From the following table we can observe that, about 77.9% of the respondents expressed that, there is an effect of the adoption of new technology on the organization’s reputation. Following bar chart also shows taller bar corresponding to the same.

**Is there an effect of the adoption of new technology on the organization's reputation?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid No	58	22.1	22.1	22.1
Valid Yes	205	77.9	77.9	100.0
Total	263	100.0	100.0	

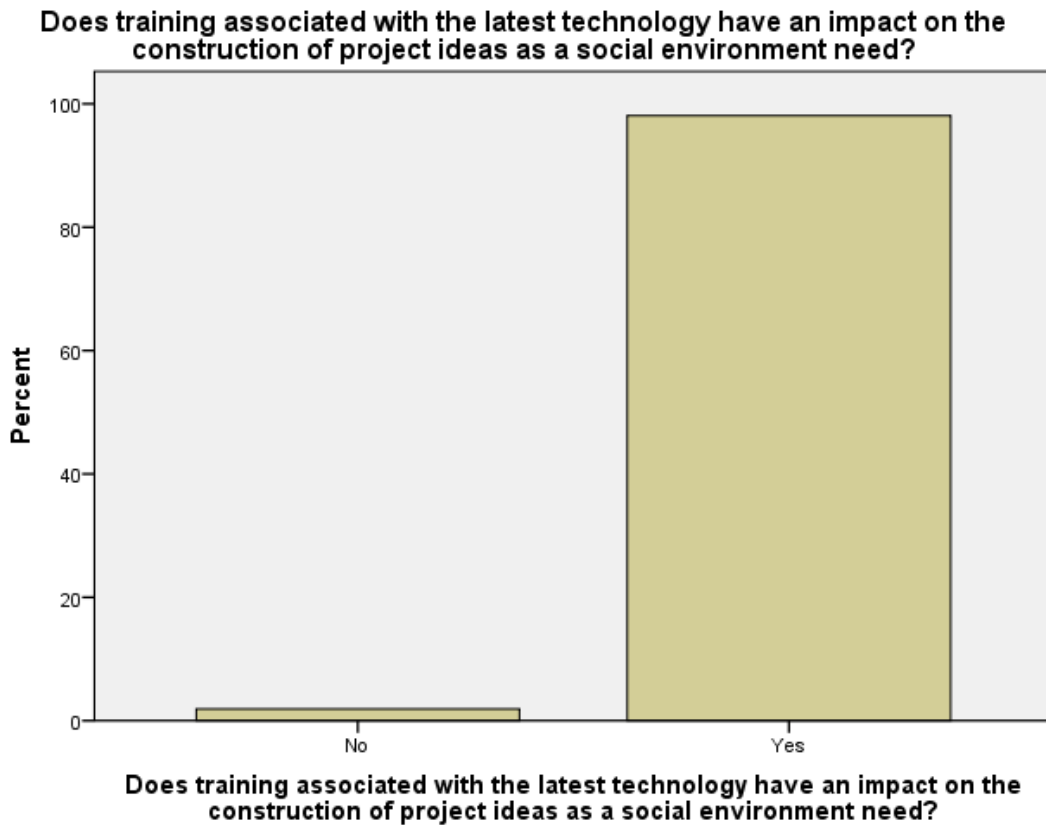


**22) Does training associated with the latest technology have an impact on the construction of project ideas as a social environment need?**

From the following table we can observe that, about 98.1% of the respondents expressed that, training associated with the latest technology have an impact on the construction of project ideas as a social environment need. Following bar chart also shows taller bar corresponding to the same.

**Does training associated with the latest technology have an impact on the construction of project ideas as a social environment need?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	5	1.9	1.9	1.9
Valid Yes	258	98.1	98.1	100.0
Total	263	100.0	100.0	

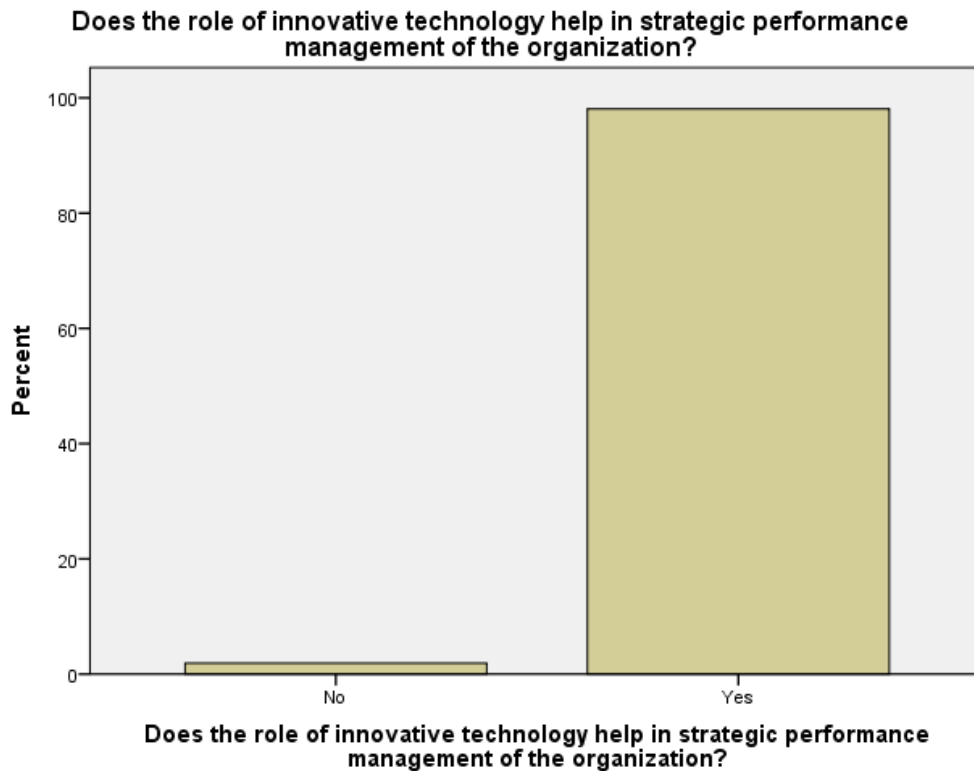


**23) Does role of innovative technology help in strategic performance management of the organization?**

From the following table we can observe that, about 98.1% of the respondents expressed that, role of innovative technology help in strategic performance management of the organization. Following bar chart also shows taller bar corresponding to the same.

**Does the role of innovative technology help in strategic performance management of the organization?**

	Frequency	Percent	Valid Percent	Cumulative Percent
No	5	1.9	1.9	1.9
Valid Yes	258	98.1	98.1	100.0
Total	263	100.0	100.0	



**CHI-SQUARE TEST OUTCOMES:**

Test 1:

**Creativity**

	Observed N	Expected N	Residual
Medium	86	87.7	-1.7
High	133	87.7	45.3
Very high	44	87.7	-43.7
Total	263		

	Creativity
Chi-Square	45.224 <sup>a</sup>
Df	2
Asymp. Sig.	.000

Test 2:

**Monitoring, Communication, Mix Strategy**

	Observed N	Expected N	Residual
Low	8	65.8	-57.8
Medium	55	65.8	-10.8
High	142	65.8	76.3
Very high	58	65.8	-7.8
Total	263		

	Monitoring, Communication, Mix Strategy
Chi-Square	141.821 <sup>b</sup>



Df	3
Asymp. Sig.	.000

Test 3:

**Sales (Negotiations & Retailing)**

	Observed N	Expected N	Residual
Medium	99	87.7	11.3
High	104	87.7	16.3
Very high	60	87.7	-27.7
Total	263		

Sales (Negotiations & Retailing)	
Chi-Square	13.240 <sup>a</sup>
df	2
Asymp. Sig.	.001

Test 4:

**Packaging**

	Observed N	Expected N	Residual
Very low	1	52.6	-51.6
Low	28	52.6	-24.6
Medium	87	52.6	34.4
High	104	52.6	51.4
Very high	43	52.6	-9.6
Total	263		

Packaging	
Chi-Square	136.601 <sup>c</sup>
Df	4
Asymp. Sig.	.000

Test 5:

**Product Development & Formulation**

	Observed N	Expected N	Residual
Low	8	65.8	-57.8
Medium	59	65.8	-6.8
High	106	65.8	40.3
Very high	90	65.8	24.3
Total	263		

Product Development & Formulation	
Chi-Square	85.000 <sup>b</sup>
df	3
Asymp. Sig.	.000

**Test 6:**

**Business Plan**

	Observed N	Expected N	Residual
Very low	8	65.8	-57.8
Medium	34	65.8	-31.8
High	123	65.8	57.3
Very high	98	65.8	32.3
Total	263		

	Business Plan
Chi-Square	131.722 <sup>b</sup>
df	3
Asymp. Sig.	.000

**Test 7:**

**Project Management**

	Observed N	Expected N	Residual
Very low	8	65.8	-57.8
Medium	43	65.8	-22.8
High	148	65.8	82.3
Very high	64	65.8	-1.8
Total	263		

	Project Management
Chi-Square	161.532 <sup>b</sup>
df	3
Asymp. Sig.	.000

**Test 8:**

**Ethics & Sustainability**

	Observed N	Expected N	Residual
Medium	66	87.3	-21.3
High	88	87.3	.7
Very high	108	87.3	20.7
Total	262		

	Ethics & Sustainability
Chi-Square	10.107 <sup>d</sup>
df	2
Asymp. Sig.	.006

**ANOVA TEST TABLE:**

		Sum of Squares	df	Mean Square	F	Sig.
Creativity	Between Groups	3.761	4	0.940	1.863	0.117
	Within Groups	130.193	258	0.505		
	Total	133.954	262			
Monitoring, Communication, Mix Strategy	Between Groups	1.133	4	0.283	0.484	0.748
	Within Groups	151.012	258	0.585		
	Total	152.144	262			
Sales (Negotiations & Retailing)	Between Groups	2.795	4	0.699	1.119	0.348
	Within Groups	161.174	258	.625		
	Total	163.970	262			
Packaging	Between Groups	3.653	4	0.913	1.138	0.339
	Within Groups	207.008	258	0.802		
	Total	210.662	262			
Product Development & Formulation	Between Groups	2.082	4	0.521	0.721	0.578
	Within Groups	186.275	258	0.722		
	Total	188.357	262			
Business Plan	Between Groups	1.760	4	0.440	0.569	0.685
	Within Groups	199.456	258	0.773		
	Total	201.217	262			
Project Management	Between Groups	4.678	4	1.170	1.702	0.150
	Within Groups	177.261	258	0.687		
	Total	181.939	262			
Ethics Sustainability &	Between Groups	0.496	4	0.124	0.175	0.951
	Within Groups	183.299	258	0.710		
	Total	183.795	262			

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**International Journal of Advances in  
Engineering and Management**

**ISSN: 2395-5252**



# IJAEM

**Volume: 02**

**Issue: 01**

**DOI: 10.35629/5252**

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