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**Business characteristics and innovation: Are “megatrends” the  
answer?**

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## ABSTRACT

This master thesis explains the characteristics of business, the innovation and the megatrends in our days. As the part of characteristics in business block chain is a powerful technology that enables organizations to transform their business processes. Its ability to provide transparency and integrity allow them to make informed decisions. However, due to the emergence of new technologies such as the Internet of Things and service-oriented architecture, it is becoming more challenging to manage these tools. Getting a good understanding of the physical resources that are needed for a successful supply chain is the first step in establishing a strategy that will allow you to improve the efficiency of your operations. This will allow you to make informed decisions and make better decisions regarding the value and revenue that your organization generates. Understanding the physical resources that are needed for a successful supply chain is the first step in establishing a strategy that will allow you to improve the efficiency of your operations. According to some theories, the concept of the structural properties of power of a supply chain is based on the competition between multiple parties. One of the most important steps in establishing a strategy for a successful supply chain is to understand the physical resources that are needed for a successful operation. This can be done through the use of analytical classification. This method will allow you to identify the multiple resources that are required to deliver a service or product. The rise of digitization has led to the development of an Internet of Things, which allows people and objects to interact with each other and manage their physical surroundings. This vision allows various objects and places to become part of the Internet. Objects and places can be equipped with mini-computers, which can collect information about their surroundings. These gadgets can then be used to connect to the

internet and interact with other smart objects. These devices are usually invisible to the eyes. Due to the increasing number of objects that can be monitored and managed through the Internet of Things, it has become a vital component of business management. Supply chains are a process that involves extending a company's supply chain from one supplier to another. They are also responsible for coordinating the various activities of the company's partners. According to Lee, the most successful organizations have supply chains that are agile, adaptable, and aligned. The success of a supply chain is determined by its ability to meet its customers' needs. This is done through the development of its partners and the effective management of its various components. Aside from the various factors that affect its success, the managers of organizations also need to make sure that their supply chains are well-equipped to respond to changes in the market. Also, Innovation is becoming more prevalent today. Organizations are incorporating it into their mission statements, vision statements, and objective statements, and more chief innovation officers are becoming more common. Moreover, university campuses are becoming incubators for innovation. Despite the increasing number of people using the word innovation, it has been called America's most over-used word. This is because the widespread use of the term can lead to misunderstandings about what innovation really is, which can cause companies to make erroneous decisions. Believing that an innovation should only be radical or completely new is also a common misunderstanding. For example, some companies think that minor changes to an already existing service or product should not be considered innovation. On the contrary, radical innovation is very challenging and requires a lot of resources. Compared to incremental innovation, which involves taking a small step toward a larger goal, radical innovation has a higher risk of failure. Incremental innovation can be used to balance the efforts of radical innovation and the pursuit of bigger goals by allowing small wins. Organizations that

successfully utilize this type of innovation are aware that it is not just a binary phenomenon. We found seven categories of innovation, product innovation, process innovation, marketing innovation, business model innovation, supply chain innovation, organizational innovation. Industry 4.0 is a framework that aims to address the various aspects of technological advancement. It is a concept that aims to discuss the advantages of automation and digitalization. The concept is broken down into nine pillars. These include the development of analytical tools and big data. Through the emergence of autonomous robots, factories can be more productive. In addition, vertical and horizontal systems integration will allow them to perform various tasks. The rise of the cloud will allow companies to work on their projects and services from a single platform. Also, the use of 3D printing will allow them to create new products and services. Cyber-security is also becoming more important due to the increasing number of machines and artificial intelligence. The rapid emergence and evolution of technologies has changed the way businesses work. According to our research, the traditional way of managing risk has not changed in most parts of the world. However, other regions are beginning to contextualize the innovations that are being used to serve their markets. The rapid growth of China's economy has been attributed to the country's increasing desire to assimilate Western goods and the rising number of fake products being sold in the country. Although the country has been known to come up with poorly designed new ideas, it is important to note that it has also been doing business with a wide range of novelty products. New business models often require a lot of insight and creativity in order to succeed. This is why it's important that entrepreneurs have the necessary knowledge and skills to effectively implement their business models. The rapid emergence of new business models can often lead to learning and adjustments that are needed to accommodate the needs of society and customers. New business models are designed to help

managers and entrepreneurs address the various challenges they face. They can also help them develop effective strategies and implement new technologies. Although a business model might seem like a placeholder, it can eventually evolve into a more evolved version that can take advantage of technological changes and innovations. In emerging industries, it's typically not apparent until the start that the right business model is in place. Most managers and entrepreneurs are more likely to succeed when they have the necessary knowledge and skills. Finally in the chapter of megatrends there are lot of things like robo slaves, bit coins, environmental and electricity part from our lives.

## CHAPTER 1 Characteristics of Business

In 1994, the Storey framework explained how the elements of a firm's performance can be influenced by the intersection of three spheres: the entrepreneur, the strategy, and the firm. Despite the importance of these elements, Hamilton and Hansen (2011) noted that identifying which firms grow is challenging due to the complexity of the configurations of these elements. The three elements of the Storey framework are commonly found in variable-centered studies. Studies have shown that different factors can affect the performance of businesses. For instance, the size and age of firms can have a significant impact on their growth rates. Most studies on the factors that influence small firm growth have focused on the combination of life-cycle effects. Resource-based theories have also been used to consider the role of assets in helping firms grow. For instance, in Davidsson and Rangone's (2006) study, the early acquisition of resources that are difficult to acquire by other firms provides them with an advantage and allows them to develop a competitive advantage. The growth literature shows that smaller firms are more flexible and can take advantage of new opportunities, which can help them grow faster and become more profitable. They also tend to react slower to market changes as their managers are more likely to be away from the market. According to experts such as Harris and Fischer, formal planning approaches are often not designed to represent reality and are often ineffective when dealing with changing environments. For instance, in situations where the owner-manager does not have the necessary information, a plan may not be able to improve the firm's performance. It has also been argued that strategies that are flexible and unconstrained are more beneficial to small businesses. This is because they allow them to develop their own ideas and improve their

performance. Instead of creating a written strategy, it is more important that firms practice planning. Despite these experts' criticisms, a study conducted in 2006 by Richbell and colleagues found that many firms have formal planning plans. This suggests that they need to implement strategies that are designed to balance their resources and improve their performance (Blackburn, Hart, & Wainwright, 2013).

The majority of small and medium-sized enterprises (SMEs) have a wide range of turnover. About 9.4 percent of them have a turnover of less than \$100,000, while 42.2 percent have a turnover of between £500,000 and 100,000. The age of these businesses also affects their product and process characteristics. Around one-third of them are under five years old, while a third are over 20 years old. The average size of an enterprise in the sample was 15.6 individuals and ten individuals. The employment distribution within the establishments was even, with 47.8 percent of women and 52.2 percent of men. The majority of the employees were full-time workers, while around one-third were part-time (Blackburn, Hart, & Wainwright, 2013).

A business is a type of economic activity that involves the continuous production and distribution of various goods and services for satisfying the needs of its customers. In 2010, David Needle defined a business as an organized activity that involves the production and sale of goods and services to meet the varying needs of society. According to him, business is the pursuit of profit and the acquisition of wealth through the satisfaction of its customers. According to Dicksee, a business is a type of activity that aims to earn profit for the benefit of its shareholders. Lewis Henry defined business as "human activity that involves the buying and selling of goods and services." It is important to note that the word "business" can be used in different ways. For instance, it can refer to a variety of activities that a person or group of people may engage in. When individuals engage in a particular activity on a consistent basis and earn

their living, they are referred to as an occupation. Human is a business that involves the production, purchase, and distribution of goods and services. This type of activity is commonly referred to as lawful business (Needle & Burns, 2010).

A business is a type of occupation that allows individuals or groups to engage in the production, buying, and selling of capital goods and services. These activities can be carried out in various areas such as manufacturing, transportation, and banking. This business is mainly engaged in the exchange of services and goods for money. It's also focused on profit. The business activities of a company are subject to many risks and uncertainties. These include the involvement of both the buyers and sellers, and the production of goods and services (Needle & Burns, 2010).

## **1.1 Block chain**

The multiple characteristics of block chain make it an ideal technology for transforming business processes. Its transparency, integrity, and resilience allow organizations to make informed decisions. Due to the rapid emergence and evolution of new technologies, such as the Internet of Things (IoT), cloud computing, and service-oriented architecture (SOA), centralized business process management tools are becoming more challenging to manage. These tools are also prone to trade-offs between security, openness, and cost. The ability to adapt to a competitive environment is very important for businesses to survive. They need to implement flexible business processes that promote collaboration and collective decision-making. The rise of the Internet of Things (IoT) and the increasing number of devices that can be used to automate and share information are some of the factors that have created the opportunity for businesses to transform. One of the most important factors that businesses need to consider when it comes to

implementing a new technology is the availability of block chain technology. This technology can help them address various issues related to security, distribution, and cost-effectiveness. The emergence of new technologies such as the Internet of Things and the increasing number of devices that can be used to automate and share information are some of the factors that have created the opportunity for businesses to transform. Business process 4.0 aims to achieve the ultimate goals of transparency, trust, and interoperation. Due to the increasing number of studies on the many applications and theories related to block chain and consensus mechanisms, the scope of research in this area is becoming more significant. Some of the studies that are currently being conducted on this subject focus on the fundamental agreement problem in distributed systems. This issue is caused by the asynchronous processes that are involved in establishing a consensus. There has been a slight shift in how consensus is exercised. Instead of requiring all nodes to find a solution, it now relies on a message-passing model, which allows them to easily propose a solution without having to go through the process of finding a solution. System configurations can also vary depending on the level of openness and centralization. The main difference between public and private block chains is that the former is more centralized. Also, certain psychological and economic parameters are added to the consensus framework. This allows for the creation of new consensus algorithms. Compared to traditional distributed systems, block chains are more open and have a variety of features that allow for the creation of new consensus algorithms. Most studies on block chain refer to it as an informal term that is used to describe the technology's many properties and how it can be used to achieve security. A public ledger is a type of digital document that can be used to record transactions that are performed by various nodes without the central authority of a central authority. A decentralized database is a type of database that can be operated in a decentralized manner without relying on third parties.

A distributed ledger is a type of data structure that can be replicated and shared among the network's participants. A tamper-evident log is a type of database that can be used to verify the correctness of transactions. (Viriyasitavat, W., & Hoonsopon, D. 2019).

A block chain is a type of distributed ledger that allows people to share and validate information. In private block chains, a group of nodes is responsible for validating and sharing the information. These nodes are also responsible for maintaining the consensus.

A private block chain is ideal for closed systems, where all of its nodes are fully trusted. The owner of the network has the authority to control who can access the network. On the other hand, public block chains such as Bitcoin and Ethereum allow people to access and maintain the network with the necessary permissions.

A public block chain is completely open and distributed, allowing everyone to participate and leave the system. This type of system operates under untrusted and unknown nodes (Viriyasitavat & Hoonsopon, 2019).

A permissioned block chain is a type of hybrid that combines the features of a private and public Block chain. It can be used in a semi-closed system, where a few enterprises are involved. The degree to which the data is open is usually determined by the members of the consortium. This type of system can also be used to control the access to information within the block chain. Although the system is not fully open, decentralization can be beneficial. For instance, it can provide a false tolerance to prevent malicious nodes from accessing the data. Some of the prominent examples of this type of system include Stellar, Hyperledger and Oracle. Although the characteristics of different types of Block chain are different, they all share the

same benefits. These include their ability to maintain the integrity of their ledgers, provide immutability, and operate on peer-to-peer networks. Data stored in a block chain can be accessed by multiple nodes, even if they are not trustworthy. The potential of block chain technology to transform business processes is immense. Its characteristics such as persistency, validity, and transparency can help improve modern business processes and achieve transparency, automation, and digitalization. However, efforts to integrate blockchain into existing business processes are still in their early stages. The main advantage of blockchain technology is its ability to provide flexible and reliable consensus. This is because its smart contracts can be used to overcome the time inconsistency that can occur when it comes to confirming the settlement of transactions. This eliminates the need for nodes to perform manual confirmations and provides a more flexible and reliable consensus (Viriyasitavat & Hoonsopon, 2019).

## **1.2 Supply chain**

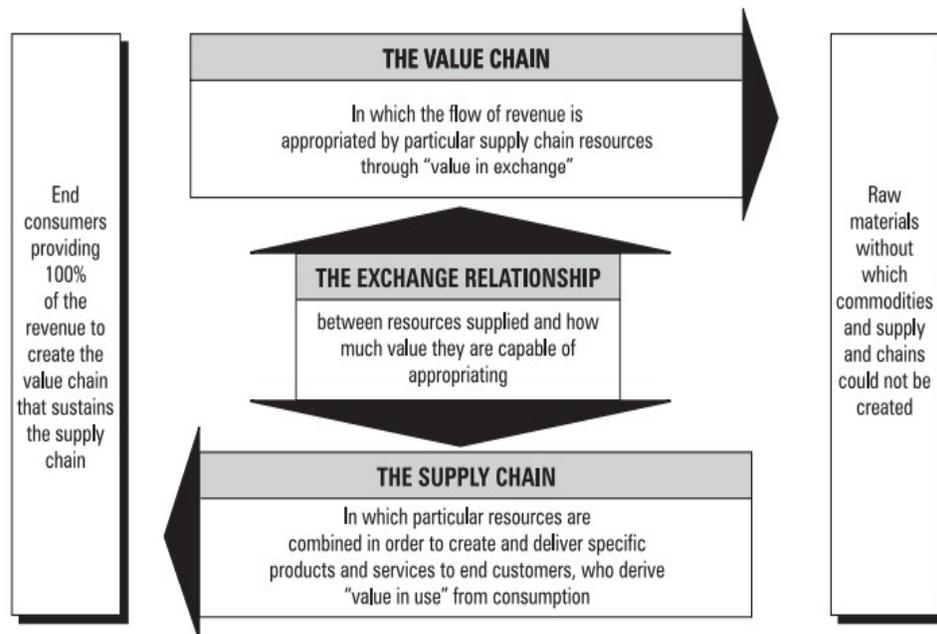
The first step in establishing a successful supply chain is to understand the physical resources that are needed to create and deliver an end product or service. This will allow us to improve the efficiency of our operations and make informed decisions regarding the flow of revenue and value. We also need to understand the relationship between the various supply chain resources and their ownership. Understanding the properties of power within a supply chain can help us make informed decisions regarding the flow of revenue and value. A more rigorous approach is to adopt analytical categorisation instead of describing the various resources that are needed to create and deliver an end product or service. This will allow us to improve the efficiency of our operations and make informed decisions regarding the flow of revenue and value. According to some theories, the physical resources that are required to construct a

successful supply chain are structural properties of power. This concept will be based on the competition between the many parties that control and own a certain resource in the supply chain. It will also be influenced by the vertical power struggle that occurs at various points in the chain. Understanding the various power struggles that occur within the supply chain will allow us to make informed decisions regarding the flow of value and revenue. This concept also helps us understand the operational environment of the companies and entrepreneurs that are involved in the supply chain. One of the most important factors that businesses or entrepreneurs need to consider when it comes to establishing a successful supply chain is the ability to achieve innovations that are designed to achieve three goals. These include: 1) closing the gap between the current and potential competitors; 2) ensuring that the innovation does not threaten the backward or forward integration of the supply chain; and 3) ensuring that the innovation does not create a competitive advantage. The innovation should not be carried out within a supply chain environment that is characterized by the appropriation of value flows to other players in the chain who have better resources. This type of environment should not threaten the backward or forward integration of the supply chain. Preferably, a benign power structure exists within the supply chain. It can be argued that the ownership of these attributes can be demonstrated by the relative resources capacity of the owners of these resources to appropriate their value for themselves through the participation in the supply chain. This is because the exchange of goods and services is carried out through a value chain.

The concept of the value chain refers to the revenue that the end consumer of a product or service generates through the exchange of goods and services. This is the revenue stream that the various stages of the supply chain receive (Cox, 1999). Moreover, the value chain is leading us to raw materials and the supply chain in some particular resources are combined to create and

deliver products. Also consumers should provide the 100% of the revenue to create the value chain. Finally between the value chain and the supply chain we have exchange relationship especially on how value they are capable of appropriating. Consequently, there is a fundamental exchange link between the supply chain and the value chain, which is described in the Figure 1(Figure 1, Cox, 1999).

**Figure 1.** Supply and value chain mapping



Source: Adapted from Andrew Cox, *Business Success*, (Earlsgate Press, 1997a), p. 207.

**Figure 1**

The “exchange relationship” between the value chain & the supply chain (Cox, 1999).

### 1.3 The triple -A supply chain (Agility, Adaptability, Alignment)

The concept of supply chains refers to the process of extending from one supplier to another. It involves coordinating the various functions of a company's supply chain with its partners. According to Lee (2004), the most successful organizations create supply chains that

are adaptable, agile, and aligned. The success of a supply chain depends on its ability to meet the needs of its customers. This is done through the continuous development of its partners. The managers of organizations must also manage their supply chains well in order to meet the needs of their customers. The various factors that affect the success of a supply chain include the ability of its many components to respond to changing market conditions, the alignment of marketing and financial strategies, and the establishment of effective communication channels (Whitten, Green & Zelbst, 2012).

Although Lee (2004) pursued a more abductive approach to develop the Triple-A theory, this research takes a deductive approach to verify the concept. We present a framework that incorporates the Triple-A construct into a supply chain performance model. The model aims to provide a deeper understanding of the antecedents of supply chain performance and organizational performance. The study constructs were evaluated using a small sample of supply chain professionals. The data collected during the study were then analyzed using a statistical method to evaluate the validity, reliability, and dimensionality of the study scales. The structural model was then used to analyze the data (Whitten, Green & Zelbst, 2012).

According to Lee (2004), Triple-A supply chains are those that exhibit agility, alignment, and adaptability. They are able to respond quickly to variable demands and changes in market conditions by establishing a resilient supply chain that can adapt to these changes. The most successful companies also integrate and coordinate their business processes to achieve an equitable distribution of risks and benefits. The concept of the Triple-A supply chain is regarded as a second-order construct that combines the various dimensions of agility, alignment, and adaptability. Although other research has used the concept of flexibility as a framework for

building a resilient supply chain, it has not included all three dimensions. (Lee, 2004). The ability to adapt and manage change is a dynamic part of an organization's operations that can help it achieve competitive advantage. This is evidenced by the development of Triple-A supply chain capabilities that are designed to respond to the changing needs of customers. The complexity of the supply chain networks is often linked to the various capabilities that are integrated into them. As a result, partnering organizations develop and renew their adaptive systems to respond to the changes in the markets and economies. This allows them to maintain their competitive advantage and deliver value to their customers (Whitten, Green & Zelbst, 2012).

Agility: Being agile is a critical component of a successful supply chain. According to Lee, in 2004, agility is the ability to respond quickly to changes in demand and supply. This is also the ability to manage disruptions effectively and efficiently. One of the most important factors that a company can consider when it comes to improving its supply chain is the synchronization of its multiple supply chain partners.

One of the most important factors that a company can consider when it comes to improving its supply chain is the establishment of strong, long-term relationships with its suppliers. This can be done through the development of production processes that are designed to facilitate postponements and the building of inventory buffers. Through agility, supply chain partners can work together to respond quickly to changes in customer demand, which can be achieved through the integration of various information systems (Lee, 2004). This ability to react to changes in demand can be achieved depending on the level of coordination among the partners. Through the sharing of information, supply chain partners can improve their

performance and reduce their risk. This process can also help them respond faster to their customers' needs. Having the necessary information allows them to make informed decisions and improve their supply chain management. As a result, supply chain partners should be able to function as reliable partners. They should also develop a degree of flexibility to respond to changes in customer demand. This is because the likelihood of a change in demand increases the need for them to adapt to meet the needs of their customers (Whitten, Green & Zelbst, 2012).

Adaptability: Adapting to the changes brought about by the supply chain is a vital part of any organization's operations. According to Lee, adaptability allows the supply chain to adapt to the changes brought about by the market. Successful companies are able to do so by developing strategies and implementing procedures that can adapt to the changes brought about by the market. To identify new markets and supply bases, organizations should regularly monitor the developments in the global economy. They should also develop effective logistics infrastructures and create flexible product designs. They should also evaluate the needs of their customers and determine where their products stand in terms of their life cycle and technology. In addition, the concept of adaptability is important as supply chains constantly adapt to the changes brought about by the rapid emergence and evolution of new technology and products. This can help them function more efficiently and effectively (Lee, 2004). Lastly, the ability to adapt to changes in the environment is very important for organizations that are involved in the supply chain. This is because, in order to respond to the needs of their customers, they need to be able to make informed decisions. Due to the lack of clarity regarding the various factors that affect the supply chain, such as cost, quality, and delivery, organizations are constantly looking for new suppliers and vendors. This is why they are focusing on infrastructure renewal and environmental scanning to develop new markets and supply bases. One of the most desirable factors that organizations

are looking for in a new supplier is the ability to create flexible designs. This can be done by developing products that can be easily adapted to different markets. In addition, the increasing number of products and the shrinking life cycles of technologies are forcing companies to rethink their approach to supply (Whitten, Green & Zelbst, 2012).

Alignment: Great firms are able to align their interests with those of their customers and suppliers. They can do this by freely sharing information with them and by clearly explaining their responsibilities to their customers. To achieve their goals of competitive advantage, organizations must align themselves with their supply chain partners. This can be done through the development of effective business processes that involve the multiple elements of their supply chain. In addition to the internal functions of an organization, alignment also extends to the supply chain partners of an organization. This is because the need for external alignment is often overlooked. The information systems that are designed to support the flow of information across the supply chain are very important to ensure that the various partners have the necessary information to make informed decisions (Lee, 2004). Enterprise planning systems can help promote the exchange of knowledge and improve the efficiency of the whole process. Through supply chain partnerships, organizations can share risk and improve the efficiency of their operations. This process can help them reduce their costs and improve their customer service. In addition to being involved in the overall operations of a company's supply chain, supply chain partners also play various roles. These roles and responsibilities should be clearly defined and communicated in a strategic manner. Like the functional areas of an organization, partners are expected to perform their assigned tasks (Whitten, Green & Zelbst, 2012).

## CHAPTER 2. The internet of things in business

The rise of the Internet of Things (IoT) is a new computing paradigm that is expected to transform various industries' operations and strategies. The IOT has to do with the connection of multiple computing devices, digital machines, cars and even heart monitors that can all connected and monitored (Meola, 2022) (Figure 2). It is a potential game-changer for business processes and technologies. Even in low-tech industries, the Internet of Things (IoT) has the potential to become a major threat. For instance, if wireless sensors were to be used in farming, it would be surprising to think that this type of technology was used in a previously low-tech industry. Despite this, IoT can still provide new opportunities for entrepreneurs and business leaders. According to estimates, there will be more than 50 billion connected devices by 2025, which will create a huge market for the Internet of Things (IoT) (Krotov, 2017).

A technological environment is composed of various hardware, software and networking technologies that enable the interactions between objects in a physical space. The socioeconomic environment is composed of various stakeholder groups. First, it is composed of business leaders and entrepreneurs who are working toward establishing a framework for the development of the Internet of Things (IoT). These individuals are responsible for connecting the dots in the IoT landscape and addressing legal and technical issues related to the technology. Various organizations, including government agencies and industry associations, have set standards for the Internet of Things (IoT) to ensure that its components are safe and can operate efficiently (Krotov, 2017). The success or failure of a business venture is often determined by its customers. This is why it is important for entrepreneurs to target their potential customers through the Internet of Things (IoT).

Entrepreneurs play a vital role in the development of the Internet of Things (IoT). They are driven by their desire to contribute to the communities they live in and their technical knowledge. They use their intuition and business experience to create new business models that are designed to address the needs of their customers. Getting the most out of the Internet of Things (IoT) requires entrepreneurs to address various technical and managerial issues in order to bring their ideas to fruition. They also need to develop new business processes and connect the dots in order to make the most of the potential of the IoT. Although there are many potential innovations that can be made through the IoT, most of them fall under two categories: sustaining and disruptive. Sustaining innovations aim to improve an existing service or product by adding a new dimension to it. For instance, by adding a blade to a traditional razor, it can provide a quicker and gentler shave. While disruptive innovations are usually focused on creating new products and services, they can also be used to disrupt existing markets. For instance, the development of an ultrasound device that can make hair fall off with just a button could be a disruptive innovation in the shaving industry (Krotov, 2017).

The role of consumer has changed due to the changes brought about by the market and society. Today, consumers have more information about the products they are buying. Due to the rise of globalization, they can now choose their desired products from a variety of prices and capabilities across different regions. Through networking, companies and individuals can share their thoughts and feelings about certain products and services. This allows the company to develop new perspectives and ideas on how to improve the customer experience. The rise of the Internet of Things (IoT) has been one of the most significant factors that has contributed to the development of this technology. It has allowed companies to create new and innovative products and services that are designed to meet the needs of their customers. In addition, it has led to the

increasing efficiency of existing businesses by allowing them to create value added services and products. Due to the emergence of Internet of Things (IoT), business models have been defined as projects that are designed to generate profit and income for a company. Unfortunately, if a company does not have an organized plan to achieve profitability, it will most likely fail (Hamidi & Jahanshahifard, 2018).

Due to the nature of the Internet of Things (IoT), it is no longer appropriate for traditional business models to be based on a company-based frame. Instead, they should be designed to be in touch with the industries and competitors that are involved in the ecosystem. In addition, the rapid emergence and evolution of new sales models in technology-based industries have prompted companies to rethink their approach to the market. The innovation in business model presented by IOT shows a new direction in terms of competitive advantages. Some of the key issues that were identified during the development of this concept are detailed in this article. In terms of value creation in IOT, there are three levels: production, support, and value creation (Hamidi & Jahanshahifard, 2018). The first level is where manufacturers and vendors can create products and services that can be used in the production process. The second level is where data collection is performed, and the third level is where the company can partner with a creative organization due to the network of things that can be considered. The concept of value chains refers to the sequence of activities that a company performs in order to create value. It is different from traditional products in that it involves more complex projects. However, the basic design of these chains remains the same. Without competition, companies will not be able to build smart cooperation. This is why it is important that they are able to develop effective value propositions and competitive strategies. There are two main elements of this concept: the value network and the competitive strategy. The former is a framework that enables companies to

establish a competitive advantage and the latter is a framework that enables them to manage their business.

The digitization of the physical world has led to the development of the Internet of Things, which has made it possible for high-resolution management of objects and places in the physical world. The concept of the Internet of Things is a vision that allows any object or place to become a part of the Internet. Objects and places are often equipped with mini-computers that allow them to collect information from the environment. These devices can then be used to interact with other smart objects and the internet. These mini-computers are typically invisible to the eyes, and they are often used to connect objects to the internet. The ability to monitor and manage objects has become a vital part of business management. Since a company can only measure what it can, the Internet of Things has the potential to transform the way it operates. Through the use of the Internet of Things, objects can be economically identified and can become measurable. This innovation has led to the development of a hybrid structure that combines the digital and non-digital models. IOT refers to the process of expanding the integration of physical objects into the digital world. For instance, how hardware is made is influenced by the digital levels. If the digital levels are regarded as separate and isolated, it would be hard to provide various attractive services. The increasing number of Internet solutions requiring hardware has led to the development of new technologies that combine digital services and physical products. The concept of IOT business models can be described as a combination of a traditional product and an updated technology. For instance, an IOT solution can be considered as a combination of a traditional product and an updated technology. This process can be beneficial for the client as it allows them to benefit from the various advantages of physical

products and digital services. The low cost of implementing this technology makes it an ideal choice for the client (Hamidi & Jahanshahifard, 2018).

Due to the rapid pace of change and the increasing complexity of today's business environment, every enterprise needs to be more agile and responsive to changes. This can be done through the adoption of new technologies and the shift away from traditional methods of doing things. In addition to adopting new technologies, this approach also involves integrating them into a comprehensive framework to enable businesses to work more efficiently. The goal of inciting growth should be acknowledged as the digital transformation process moves into a total business transformation. The goal of digital transformation is to create new value for customers and employees by transforming the way they do business. This is done through the development of new processes and technologies that enable organizations to transform their operations and deliver new value to their stakeholders. One of the most effective ways to accelerate the digital transformation process is through the deployment of the Internet of Things (IoT). This survey reveals that an organization's digital transformation efforts should be focused on a broad-based initiative. The rise of the Internet of Things (IoT) has created new opportunities for businesses to collect and analyze data. Its ability to connect and interact with devices and people has the potential to transform their operations. The various technologies that are used to collect and analyze data have the potential to transform an organization's operations and improve its efficiency. They also require a strategy that considers the various factors that affect a company's digital transformation. This approach can help transform an organization into a digital business, and it can help solve various business problems (Haaker, Nguyen-Thanh & Nguyen, 2021).

As companies adopt cloud computing, they are also looking into how they can use the collected data to improve their operations and provide more effective services to their customers.

One of the main factors that companies are looking into is the use of data to solve consumer problems. There are various applications of the Internet of Things (IoT) in various industries. These include healthcare, retail, agriculture, and industrial. Examples of smart building management systems that utilize the Internet of Things (IoT) include intelligent traffic light systems and smart building management. These systems can be used in urban areas to improve the efficiency of their operations. In addition, through the use of green wave theory, a precision irrigation solution can be developed to help farmers achieve sustainable and profitable farming activities. Despite the immense potential of the Internet of Things (IoT), studies have been focused on the technological aspects of the technology. However, they have not considered the managerial aspects of the technology (Haaker, Nguyen-Thanh & Nguyen, 2021). Some of the most common factors that can be considered when it comes to creating value from the technology include the availability of sensors, cloud computing, and RFID. The traditional seller-buyer relationship is no longer relevant as a business ecosystem has evolved. Instead, companies are now partners that are closely associated with each other. This changes the relationship between their customers and the company.

The ability to transform data into value is a key component of the BM, as it allows companies to quickly innovate and create new products. This is also due to the increasing need for digital platforms that handle the data generated and used by smart products. In addition, the cost structure of doing business is changing due to the complexity of the process. The various requirements of the digital transformation are required to be met in order to transform the business operations of companies. The goal of digital transformation is to transform an organization's operations and business performance by leveraging various resources and technologies. This process can be done through an interdepartmental collaboration that focuses



## 2.1 Blockchain and internet of things

The term blockchain has been used to describe a technology that enables the integrity and immutability of data by allowing it to be stored across multiple distributed networks. This type of secure technology is ideal for applications that require the protection of data.

The two basic foundations of blockchain technology are its immutability and its ability to provide a secure environment. The data structure of the system uses blocks of transactions to form a blockchain ledger, which is designed to provide immutability and irrevocability once the transactions are stored. Before the transactions are included in the ledger, the nodes that are involved in the process verify and agree on the same view of the blockchain. In the users' perspective, the information being stored as transactions is considered to be trustworthy (Viriyasitavat, Anuphaptrirong & Hoonsopon, 2019).

The advent of smart contracts has broadened the scope of transactions that can be performed by a blockchain. This type of technology allows for the creation of process logics that are coded as transactions. This ensures that the operations performed by a blockchain are conducted in a manner that is transparent and authentic. There are a variety of use cases for IoT security that are related to blockchains (Dai, Zheng & Zhang, 2019).

The forms of blockchain are often distinguished from one another by their decentralization and the way they are used in a system. While they are commonly deployed, blockchain modes retain the benefits of BCT. They can operate on a peer-to-peer network with varying degrees of decentralization. Through a combination of consensus mechanisms, multiple nodes can protect the integrity of a blockchain. Data is then stored in the blockchain as

transactions are immutable, even if some of them are acting maliciously (Viriyasitavat, Anuphaptrirong & Hoonsopon, 2019).

There are three main types of blockchain systems that operate. One of these is private, which is a centralized type of system that distributes ledgers to a group of nodes. Since it's not open to the public, users must be verified in order to participate. The other two are authorized nodes and consensus processes.

A private blockchain is ideal for systems that require the trust of all nodes. Unlike public blockchain, private blockchain only allows people to access and maintain the ledgers. It does so by running a pre-defined consensus. This ensures that the ledger's integrity is maintained (Dai, Zheng & Zhang, 2019). In addition, anyone can freely leave the system at any time. Public Blockchain can ensure that the system is secure from untrusted nodes. On the other hand, permissioned blockchain is a type of system that allows nodes to be trusted with equal rights. This system is created by carefully recruiting multiple parties to be nodes. This type of system can be used for semi-private systems, where a few enterprises form a consortium. Although the system is not completely distributed, some of the blockchain properties are still retained. This ensures that the system can maintain its integrity (Viriyasitavat, Anuphaptrirong & Hoonsopon, 2019).

Despite the initial lack of interest in the technology, BCT has gained widespread acceptance and is expected to play a significant role in the development of the Internet of Things (IoT). Its intrinsic properties make it ideal for various applications and scenarios. One of the main advantages of BCT is its ability to establish trust between multiple data sources without the need for third parties. This eliminates the need for intermediaries and allows for automatic

interoperation between various applications and humans (Viriyasitavat, Anuphaptrirong & Hoonsopon, 2019). Through its ability to allow the creation of new business opportunities and improve existing ones, BCT can help many organizations develop their IoT applications. The various types of applications can be categorized into five groups: smart city, digital supply chain, surveillance system, big data, and vehicular system.

One of the most important areas that is related to the integration of the Internet of Things and BCT is the Digital Supply Chain. This is a dynamic collaboration between many organizations that enables them to exchange information and manage their various supply chains. In addition to being able to exchange data, this type of collaboration also allows them to process transactions from sensors. Modern DSC systems are designed to be adaptable to meet the needs of their customers by delivering enhanced visibility and automation (Dai, Zheng & Zhang, 2019). These systems also require a seamless integration with other applications. Traditional DSC systems have been designed to operate under the supervision of third parties. However, these systems can be very opaque and could lead to various trust problems. One of the most common problems that could arise is fraud. With the use of blockchain technology, these problems could be handled by a decentralized system (Viriyasitavat, Anuphaptrirong & Hoonsopon, 2019).

One of the most critical factors that contributes to the development of smart cities is the availability of resources and technology. The rise of the Internet of Things (IoT) has created numerous opportunities for sharing economy. For instance, by automating the M2M interaction between electricity trading firms, the exchange can benefit from the data collected by the IoT (Dai, Zheng & Zhang, 2019).

The rapid emergence and evolution of the BCT and IoT ecosystem has created new business opportunities for companies. One of the most critical factors that will affect the growth of this market is the security of the data collected at higher granularity. This is why the following paragraphs provide a few proposals that will help companies develop effective strategies to capitalize on these new opportunities (Dai, Zheng & Zhang, 2019).

The energy trading industry is the first application area of the Internet of Things (IoT). Through the use of the IoT, industrial machines can now trade energy efficiently and effectively. This type of trading is carried out in different forms such as grids, electricity harvesting networks, and vehicle-to-grid networks. In this context, Li et al. proposed the creation of a blockchain consortium that would allow energy trading in the Internet of Things (IoT) (Viriyasitavat, Anuphaptrirong & Hoonsopon, 2019). To address the delays in the confirmation process, a credit-based payment system would be used to facilitate fast trading. This innovation would allow P2P energy trading to occur through energy-coin loans.

### **2.3 Real Business Cycles in a Small Open Economy**

The real business cycle approach, which was pioneered by Edward Prescott and Finn Kydland in 1982, has been the focus of a lot of attention in the field of dynamic macroeconomics. The concept of the real business cycle is based on the empirical regularities that can be found in the economic changes that occur. For instance, productivity disturbance can motivate individuals to adjust their consumption and investment strategies. The real business cycle is also consistent with the observed stylized facts. For instance, it can generate procyclical changes in consumption and investment, which can cause asset prices to exhibit more variability. It can also produce positive persistence in macro-economy.

In a business cycle, a common “vicious” scenario is the recession. Recession is cascading decreases in output, employment, income, and sales and this particular situation has been described as a “wildfire” because it spreads in most industries and regions (Lakshman, 2020). After the recession, the diffusion of recessionary weakness throughout the economy depends on this domino effect. This business cycle is outlined in Figure 3.

In most countries, the empirical regularity of key international and domestic economic indicators is well-established. This is evidenced by the historical record of these aspects of the business cycle. The empirical regularity of key international and domestic economic indicators is well-established. This evidence suggests that the two main elements of modern open economies are the positive correlation between domestic and national savings and the countercyclical movement of the balance of trade. According to studies, investment tends to react differently to productivity shocks than in closed-economy models, and foreign markets allow people to separate their savings and investments. This tendency to generate separation shocks has been studied in various ways. For instance, in 1990, Backus and colleagues found that a two-country model overstates the variability of investment. A small open economy model undervalues the correlation between savings and investment. To avoid these two anomalies, financial capital should be adjusted to a more mobile level. This is a departure from the conventional view that physical capital is more mobile. (Mendoza, E. G. 1991)

# What is a Recession?

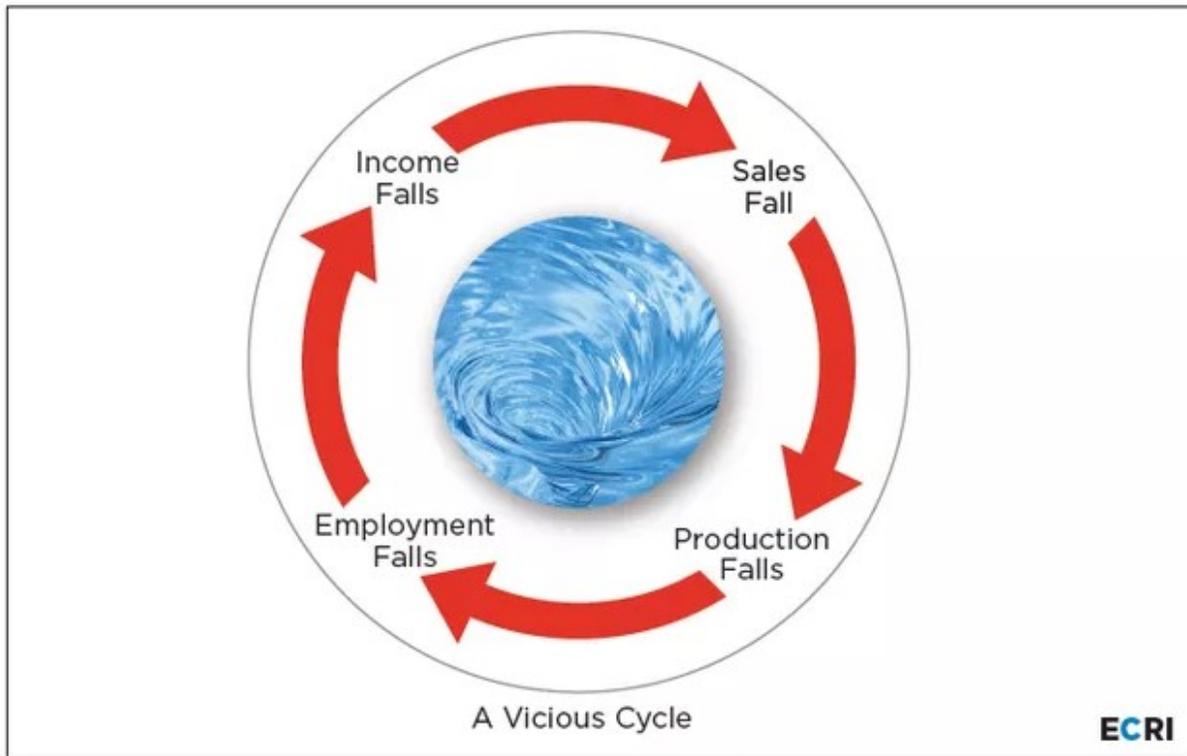


Figure 3

The business “recession” cycle (Lakshman, 2020).

## CHAPTER 3. Innovation in Business

Today, innovation is everywhere. Organizations are incorporating the term into their mission, vision, and objective statements, and politicians are frequently mentioning it in their speeches. Chief innovation officers are also becoming more common. There are also centers for innovation on university campuses. Despite the widespread use of the word, it has been called the most over-used word in America (O'Bryan 2013). The widespread use of the term innovation has led to misunderstandings about what it means, which can result in companies making erroneous decisions and contributing to the lack of innovation in their organizations. Believing that an innovation should be radical or completely new is a common misunderstanding. For instance, some organizations think that minor incremental changes in an already existing product or service should not count as innovation. This is not the case with radical innovation, as it can be very challenging and requires special resources. Also, compared to incremental innovation, radical innovation has greater risks. Incremental innovation is often used to balance the effort of radical innovation by allowing small wins to be pursued in pursuit of bigger goals. Organizations that successfully implement this type of innovation know that it is not a binary phenomenon. It can also fall along a continuum, with minor changes to major innovations. (Kahn, K. B. 2018)

### 1) Product innovation

Product innovation refers to the development of new products or programs that are designed to meet the needs of a specific market. While the term product innovation is often used to refer to a product or service, the terms program or service can be used instead. Because of the

varying types of innovations that can be made, the term product innovation can be used to describe different kinds of offerings. ( Kahn, K. B. 2018)

A cost reduction is a permanent change in the price of a product. It's usually done to differentiate the product from its competitors and ensure that it remains competitive. For instance, in 2010, Nintendo was able to reduce the price of its Wii console to make it more affordable to consumers. ( Kahn, K. B. 2018)

A product improvement is a process that involves improving the function or form of a product. It can be done to replace an older product or to make it unavailable to customers. Usually, a product improvement is referred to as an offering that's labeled as "new and improved." For instance, a new and improved laundry product can be described as a product improvement. ( Kahn, K. B. 2018)

A line extension is a type of product that adds new functionality or benefits to an existing product. It can be used to enhance the existing product line or create new products that are not available in the market. For instance, by adding whitening toothpaste, gel toothpaste, and tartar control toothpaste to an already existing product line, it deepens the product line and adds to the appeal of the brand. A product improvement is similar to a line extension in that it adds new functionality to an already existing product. However, the difference is that the original product can still be acquired by the consumers after the line extension has been introduced. ( Kahn, K. B. 2018).

New markets are where a company can introduce its products without making any changes to the existing product. For instance, in 2005, Bristol-Myers Squibb launched its

hepatitis B drug in China. Although the drug was already widely used in the US, it had to be translated into Chinese to comply with Chinese regulations. (Kahn, K. B. 2018)

New uses for old products are often introduced in new markets without any changes to the original product. For instance, Arm & Hammer baking soda was originally marketed as a baking product, but it was eventually used as a deodorizer for refrigerators. In addition to baking soda, Arm & Hammer also introduced various other products such as laundry detergents and toothpaste. These products had new packaging and provided many functions. (Kahn, K. B. 2018)

A new category entry is when a product that is not new to the market, but is still new to the consumer. For instance, Apple's entry into the watch business with the Apple Watch is an example. (Kahn, K. B. 2018)

A new-to-the-world product is when a technological innovation that has the potential to create a completely new market for a certain product or service. For instance, the introduction of a new drug for treating a medical condition is considered a new innovation. In 2015, Novartis was able to get approval for its drug Cosentyx, which was the first new medicine to treat patients with moderate- to severe plaque psoriasis. This was the first of its kind in a new class of medicines. An example of a new-world service is when Domino's became the first company to provide drone delivery of pizza. (Kahn, K. B. 2018)

One of the most effective ways to manage the development of new products is by linking the considerations related to the product to the organization's marketing strategy. This strategy can be carried out by identifying the target market and the technology that will be offered as a new or current innovation. There are four types of strategies that can be used to develop new

products: market penetration, product development, market diversification, and new market. (Kahn, K. B. 2018)

A market penetration strategy is a strategy that aims to increase the number of products sold and the number of people using them. It does not involve major changes to the current technology. Instead, it focuses on developing new products that are more cost-effective and feature better features. (Kahn, K. B. 2018)

The goal of a product development strategy is to capitalize on the current technology to increase the number of products sold and the number of people using them. This strategy can also help the organization establish a more diverse product line and attract more potential customers. (Kahn, K. B. 2018)

The goal of a market development strategy is to expand the sales volume of a product by developing new markets. This strategy usually involves geographic expansion and the targeting of new segments. No matter how old the technology is, the organization is focused on taking the product and finding new markets. (Kahn, K. B. 2018)

Diversification is a process that an organization uses to grow its bottom line by developing new business opportunities and broadening its scope of operations. This strategy involves identifying and pursuing new markets and technologies. In addition to new products, the organization also seeks to expand its current product offerings. The increasing risk associated with a company's shift from a market penetration strategy to a diversification strategy can be seen in Figure 4. The Figure 4 describes the shift from the current market to the new one. This is because different types of new products have varying success risks. Portfolio management is a

process that involves identifying and managing the multiple risks associated with product innovation. It is important for organizations to consider multiple types of new products when it comes to developing their product portfolio. This strategy ensures that the organization's new product is designed to maximize return and manage risk ( Kahn, K. B. 2018).



Figure 4

The product matrix in the market describes the shift in the current market to the new one, involving the risk from a penetration strategy to a diversification strategy (Kahn, 2018).

## 2) Process innovation

Innovation refers to the process of changing a procedure or methodology to achieve efficiency, which can include higher throughput, lower cost, or faster processing. This type of innovation has a model that includes three phases: “discover”, “develop” and “deliver”. During the discover stage, the company looks around for possible opportunities and defines them. In the develop phase, when technical requirements are established and the offering's design is fulfilled,

promising opportunities go forward. Lastly, in the deliver phase, the offering is presented and put to use for a specific purpose, which might be selling it in the market. This model can be seen in the Figure 5. Organizations, production systems, and service delivery systems are some of the areas where process innovation can be seen. Aluminum producer, Alcoa, used a process innovation to increase the aluminum's formability by 40%. This resulted in the company being the first to produce advanced automotive aluminum. The product was incorporated into the various components of the Ford F-150, which was the first vehicle to use this type of material commercially. In 2017, the Securities and Exchange Commission introduced a new process that allows companies to confidentially file their initial public offering documents. This new process is expected to encourage more initial public offerings. According to Diamond, the new process provides a flexible and efficient way for companies to access the public markets. The relationship between product innovation and process innovation is important to both parties. The former focuses on the efficiency of the process, while the latter aims to develop new products that are more effective and cost-efficient. Product innovation is about finding new ways to improve the efficiency of the manufacturing process, while process innovation is about developing new products that are more cost-effective. Unfortunately, organizations that focus too much on process innovation can prevent their product innovation efforts from being successful. This is because process innovation only helps reduce the cost of doing business. The tension between the efficiency and effectiveness of product innovation is a central issue in the management of organizations. As the market becomes more vulnerable to performance-based competition, it becomes more difficult for companies to respond effectively to this type of competition ( Kahn, K. B. 2018).

### **3) Marketing innovation**

A marketing innovation is a type of product or service that aims to connect with consumers on a new level. It can be used to create brand recognition and increase the awareness of a product or service. It is not usually sold directly to consumers. Instead, it is used to drive demand and create a unique product or service. In April 2016, Beringer Wine introduced taste strips for its products, which were placed on store shelves. The goal of these dispensers was to allow consumers to taste the wine without having to go to the store. According to market research conducted by Beringer, customers who were able to try a wine were more likely to buy it. The concept of the Taste Station was regarded as a category-changing innovation by Beringer. In 2015, the company noted that it was an industry-leading innovation (Kahn, K. B. 2018).

#### **4) Business model innovation**

Business model innovation is a process that changes the way an organization operates. It can be done in three different ways: industry model innovation, enterprise model innovation, and revenue model innovation. Model innovation is a process that involves identifying and leveraging the organization's unique assets to create new industries. It can also be done by moving into new industries or redefining an existing one. The revenue model innovation process involves generating new revenue by restructuring the pricing and product mix. The enterprise model innovation process involves changing the role of the organization in the value chain. This process can be done through the addition of new capabilities and equipment to the organization's existing networks (Kahn, K. B. 2018).

#### **5) Supply chain innovation**

The concept of supply chain innovation refers to a process that involves identifying and implementing a change within the organization's supply chain network or in a specific industry. This process can be done in various ways such as by changing the role of the organization in the value chain (Kahn, K. B. 2018).

## **6) Organizational innovation**

Organizational innovation is a process that involves the development of new strategies and methods to improve the efficiency and effectiveness of an organization. It can be triggered by many factors such as the establishment of new work environments and the introduction of new management structures. In 2014, for instance, the design of the office concept of the toy company, Lego, was aligned with the concept of activity-based working. The lack of fixed seating allowed for the creation of a more collaborative environment. This concept also eliminated the traditional physical structure of a department (Kahn, K. B. 2018).

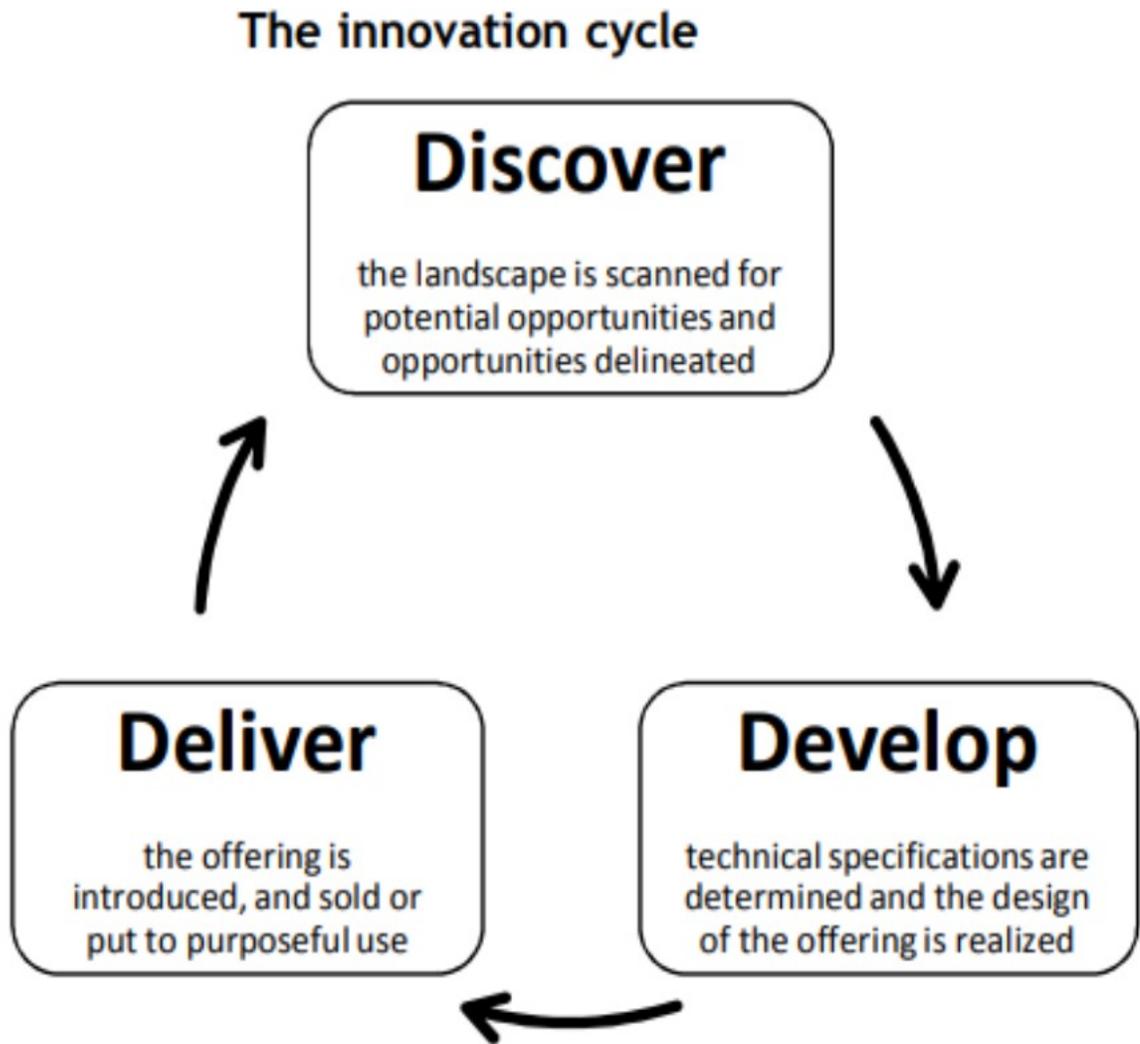


Figure 5

The process innovation model that includes three phases when delivering the final product in the market (Kahn, 2018).

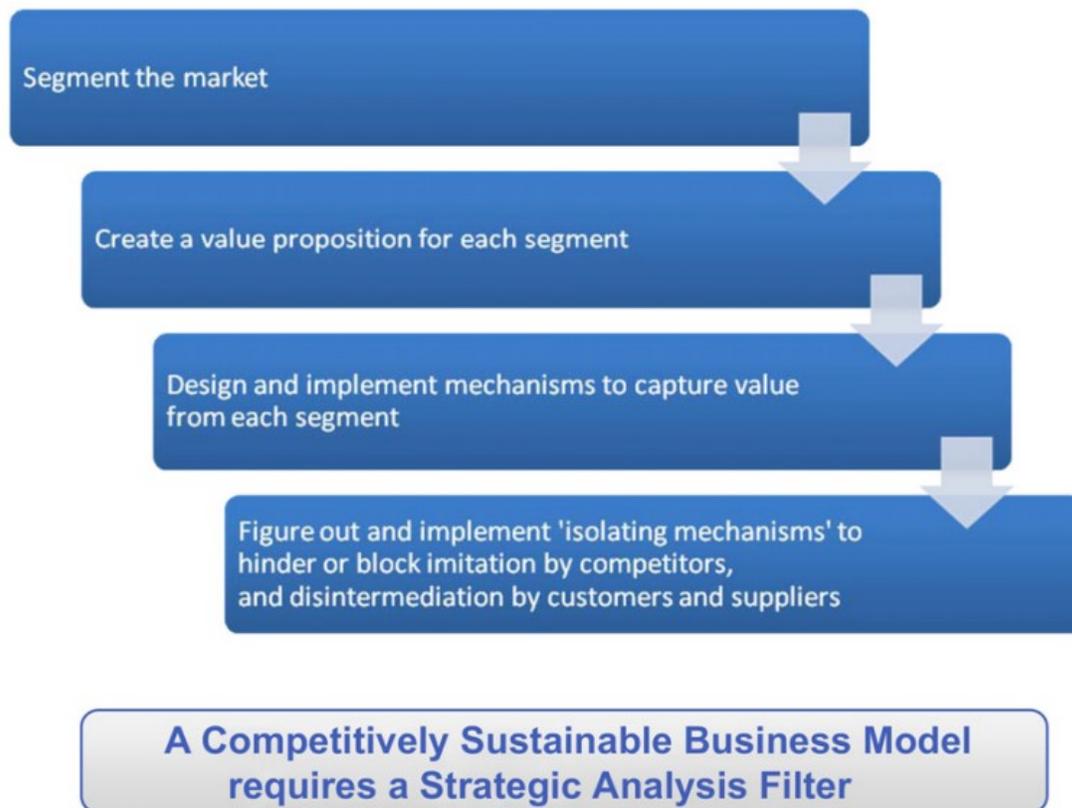
### 3.1 Business models as innovation

The technological innovation that is commonly seen in advanced societies is a reflection of the values of a more advanced society. However, new organizational forms, such as the multi-divisional structure of the Skunk Works, are not as important as the creation of new business models. In addition, the development of new methods and techniques is not as important to the

business enterprise as it is to society. Despite the technological innovation that is commonly seen in advanced societies, it is not as heroic to many people as it is to some scientists and engineers. Without it, technological advancement may not be rewarded to those who pioneered it, as well as to nations and enterprises that are still developing. Without the necessary capacity to create new business models, the value that a firm can capture will be severely compromised. Even though Thomas Edison was a celebrated inventor, he had a poor track record when it came to the development of new business models (Teece, 2010). He abandoned the recording business and failed to get direct current, which is the industry standard for transmission and generation of electricity. According to studies, unless a company can provide compelling value propositions to its consumers, the value it can capture will be severely compromised. This is why it is important that the organization has the necessary resources and capabilities to create new business models. In many cases, technological innovation is required to be matched with business-model innovation in order to capture value. For instance, small improvements in a manufacturing process can be easily captured by implementing business model innovation. However, this can also be done through the lowering of the price and increasing market share. The complexity of the revenue architecture is becoming more challenging to implement in traditional business models. This is why it is important that the innovation process is carried out in a way that enables the company to establish a differentiated competitive advantage. For instance, when it came to the Personal Computer e, Dell was able to combine the innovations of its suppliers and its distribution system to deliver compelling value (Teece, 2010).

Sometimes, new business models can lead to the creation of new industries. For instance, in the payment card industry, the companies that issue credit and debit cards work with banks and other financial institutions to process transactions. Merchants were initially unwilling to

accept credit cards that were not widely used, as card holders did not want to have cards that were not accepted by them. The innovators in the payment card industry had to invest a lot of capital in order to create a new business model. It is very important for companies to consider improving their business models to ensure that they can add value to their customers. That's why it is very important to establish sustainable and ethical business models. The steps for a sustainable model are described in Figure 6. Doing so can be very challenging, as inertia can prevent them from making changes. However, it is also preferable to start the process on its own rather than having them influenced by external events. Several investment banks in the US and other countries have recently experienced significant difficulties in implementing changes due to external factors (Teece, 2010).



### Steps to achieve sustainable business models

Figure 6

The steps in establishing a sustainable and ethical business model to overcome barriers (Teece, 2010).

## 3.2 The role of discovery, learning and adaptation

A new business model requires a lot of creativity and insight, as well as a good deal of customer, competitor, and supplier intelligence. This is why it is important that entrepreneurs are able to thoroughly understand the various components of the business model. The rapid emergence and evolution of new business models are often accompanied by learning and

adjustments that need to be made in order to accommodate the changing needs of customers and society. These new business models are intended to provide a framework for addressing the various challenges faced by entrepreneurs and managers. According to Shirky, a business model is often considered to be a placeholder until a more evolved version emerges that can take advantage of new organizational innovations or technological changes. In emerging industries, the right business model is often not apparent until the start. Most entrepreneurs and managers are more likely to succeed if they have the necessary skills and knowledge to develop a good business model (Teece, 2010).

Technological change often leads to new and better ways to meet the needs of customers. The automobile, the railroad, the horse, and the airplane have all contributed to the development of new and better ways to carry people. These solutions have also created the basis for competing business models. The rise of the internet and the computer revolution have allowed customers to more easily access and differentiate their product offerings. Social networking sites are also becoming more effective at reaching out to a target audience. Before a business can be successful, it needs to establish a comprehensive understanding of its customers' needs and the likely future behavior of its competitors. This can be done through a variety of sources, such as traditional market research and analysis (Teece, 2010). However, in order to identify emerging trends and unarticulated needs, one must also make changes to the relative merits of various technological and organizational solutions. The way society distributes and gathers news has changed significantly over the years. From the town crier to the newspaper, the Internet has become an integral part of our lives. The decline in communication costs has been dramatic, but advertising revenues have also started to shrink. This is usually the case when the underlying technology is changed, or the business model is no longer able to meet the needs of consumers.

New business models are often created from many sources. Most of the time, these are related to the fundamental understanding of how consumers are demanding and how competitors are failing to meet these needs. In most cases, the business models that are developed are based on this knowledge. However, in almost every case, the innovators fail to identify the necessary technological and organizational changes that will improve the efficiency of their organizations. Entrepreneurs who can identify and design a better way to meet the needs of their customers are considered business pioneers. They are people who are passionate about building sustainable organizations that can meet the needs of their customers. Although they may not use new technology, they must understand the organization's logic and technological possibilities. A business model is a framework that describes a firm's go-to-market strategy. It provides a basis for developing and implementing the company's strategy. Once the logic is understood, it is likely that the firm will have to re-test and adjust its assumptions (Teece, 2010).

The selection of the right pricing model and architecture for a business is not just about understanding the available options, but also about gathering the necessary evidence to validate the assumptions and probable responses of competitors, customers, and distributors. This process involves conducting in-depth fact-gathering and analysis to identify the factors that influence the decision-making process and the likelihood of successful customer relationships. In addition to making informed decisions about the future behavior of their customers and competitors, executives and entrepreneurs also need to make adjustments to their models in order to keep up with the changes (Teece, 2010). This is done by being fast in learning and adjusting to the changes brought about by the evidence. A good analytic approach for management involves identifying the various elements of a business model and then developing a strategy that will allow them to improve their efficiency. This process can be done in a variety of ways, such as by

deconstructing and revising the existing models. The goal of the strategy is to create a framework that will allow the organization to make informed decisions and manage its business environment.

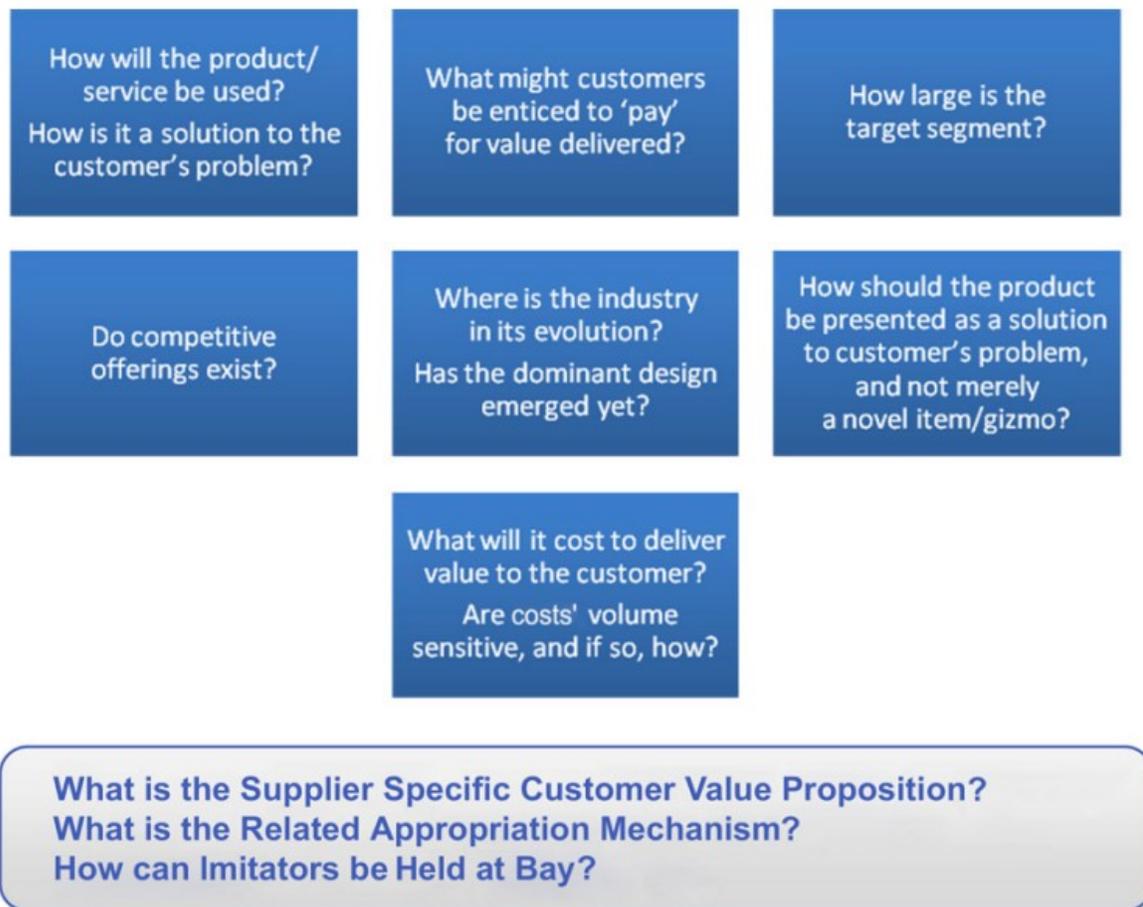
When it comes to establishing a new business, there are many factors that can affect its success. One of these is the likelihood of failure. That's why a smart way to decide which business model is right for the new business, is to establish a provisional model. However, if the business model is learned quickly and the architects are able to adjust to the changes in the market, then the chances of achieving a satisfactory profit can increase. So it is mandatory to ask specific questions because the provisional business model needs to be compared to how the company ecosystem is right now and how it might develop in the future. Doing so, will likely eliminate the risk of failure in meeting the customer's needs. These questions are described the Figure 7.

After a business model has been established, it will need to face various challenges in order to maintain its competitive advantage and adapt to the changes brought about by new technology. Even successful business models will eventually need to be revamped or even abandoned (Teece, 2010).

Due to the increasing popularity of free and cheap Web alternatives, the value proposition of the traditional licensing model for personal computer software has decreased. For some customers, this has led to the need for additional maintenance costs and the purchase of new licenses. Good business models are often conceptualized and executed in part as an art. They require managers and entrepreneurs to have a deep understanding of their customers' needs and the value chain in order to make informed decisions. This can be done through the

development of a comprehensive understanding of the multiple aspects of the business, such as the design, strategy, and operations. Market research tools can help you identify potential customers and develop a deeper understanding of them. They can also help you capitalize on the various advantages of innovation, such as the innovation cycle and the appropriability regimes. The design and selection of business models are two of the most critical components of any organization's ability to adapt to and manage the changes brought about by the changing market environment. They are also instrumental in ensuring that the company can remain competitive and profitable. Dynamic capabilities help organizations shape their environment and develop a competitive advantage. Getting the business model wrong can lead to failure, and it can also affect the company's chances of succeeding. This is why it is important that firms adopt a strategy that enables them to build a differentiated product and market segment (Teece, 2010).

A sustainable business model is about where an organization should be positioned within the value chain. It involves identifying the key assets that are required to capture value and managing them effectively. Although the industry can perform various activities within the value chain, the choices that an organization makes regarding which ones to undertake are very important. Although the concept of a sustainable business model is not fully developed yet, it is widely believed that it cannot be assessed in the abstract. This means that it can only be determined if the environment in which it operates is suitable for the organization. In addition to the business environment, other factors such as the type of business structures and strategies that an organization chooses are also taken into account to determine the appropriate choice. (Teece, 2010).



**Questions to ask about a (provisional) business model**

Figure 7

Questions that should be asked in the provisional business model in order to eliminate failure in the new business. (Teece, 2010).

**3.3 The stages in the innovation process**

A basic idea is the most common reason for a successful innovation. An inventor can develop his idea in many ways, such as by working in his garage or in his company. As the importance of science increases, more bright ideas can emerge from the minds of researchers. After gathering a basic idea, a researcher or inventor wants to test its viability. Then, they start

working on developing its first practical application. A basic idea is the most common reason for a successful innovation. An inventor can develop his idea in various ways, such as by working in his garage or in his company. As the importance of science increases, more bright ideas can emerge from the minds of researchers. After gathering a basic idea, a researcher or inventor wants to test its viability. Then, they start working on developing its first practical application. After completing a basic idea, the researcher can then start working on a prototype, which is the first step toward bringing the concept into reality. Unfortunately, the prototype usually doesn't give the inventor any satisfaction. In the development phase, the researcher must then go through various technical procedures to improve the prototype. The goal of a preindustrial product is to provide a solution that meets the technical needs of a specific market. However, further engineering is needed to reduce the production cost in order to achieve a satisfactory price. Upscalement usually takes place in the phase of upgradable. Once the technical issues are resolved and the cost is within acceptable levels, the product is marketed. (Fassin, 2000) Here are the steps in the innovation process: 1) Idea or scientific discovery, 2) Test – research, 3) Prototype, 4) Development, 5) Production- industrialization, 6) Upscaling, 7) Marketing and 8) Commercial success (Fassin, 2000).

### **3.4 The costs and the valuation of an innovation project**

The process of innovation involves many interactions and feedback loops. The cost of the project increases as the process goes through many steps. This increases the potential value of the project and the cost of the innovation. In each phase, the costs are more than expected. Even if the initial budget is reasonable, the next step to a prototype is often more expensive than the first one. This is because the next step involves more testing and development. The costs

associated with a project's various stages should be viewed as an indicator of the project's potential value. As the project's costs continue to rise, the value of the project will also increase. Although the launch of a new product is always a possibility, it is not always possible to predict its success. According to the literature on innovation, many new products fail even if they are technically good. The key to commercial success is the market. The value of time and stage of development is used to measure the likelihood of success. The lower the uncertainty factor, the higher the probability of success. This is because the more uncertainty there is, the more likely it is that the project will fail. It means that an innovation project's value is never guaranteed until it has been achieved. This means that if the project gets rejected by the market, its value will either increase exponentially or plummet to zero (Fassin, Y. 2000). This theory is described by a graphic in Figure 8, where it also shows that in order for an idea to become a commercial success, it needs a great deal of time.

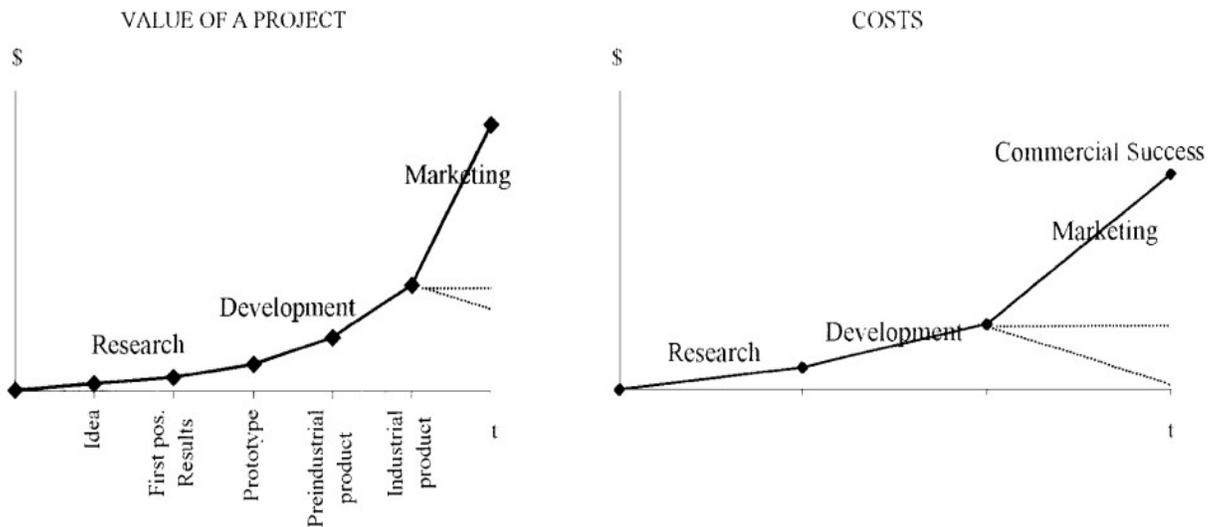


Figure 8

The value of innovation project depends on time and the probability of success (Fassin, 2000).

### 3.5 The role of the inventor or researcher

In the past, some people who were passionate about innovation could combine their talents with management and marketing skills to create a successful business. However, today, this is not possible. For researchers and inventors, the graphs should show that even if they were at the beginning of their innovation, without the necessary resources and skills, it would be hard to put their ideas into production. Some people who are passionate about innovation might have a hard time accepting the fact that their initial idea might not be the best one when it comes to the whole process. Even if it is the most important step, the final success will depend on other factors. Due to the increasing complexity of the scientific and technological environment, only a

few individuals can truly realize the multiple phases of an innovation. It can be hard for academicians and inventors to accept that even if they are highly skilled in their field, that marketing and technical development should be handled by specialists. Also, it can be hard for inventors to accept that their earnings are not returning to them. The marketing and industrialization phases require a huge financial investment. This is why it is very important for universities to have the necessary resources to handle spin-offs and know how. The value of a project increases as the development progresses, but so does the required resources. This is because the valorization of the knowledge will increase if the project is further refined. Unfortunately, both the university and the individual inventor have limited resources. The university's first mission is to develop a project that's not focused on commercialization. This means that the university's technology transfer will often be handled during the prototyping and predevelopment phase. This means that the potential value is lower than the value at that stage (Fassin, Y. 2000).

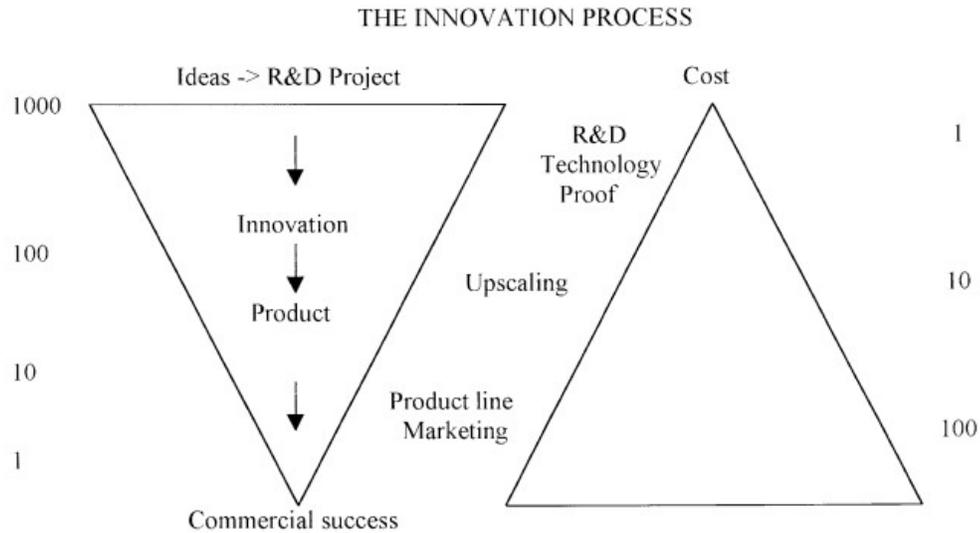
### **3.6 The need for links with the market**

One of the most important lessons that innovation literature has to teach is that a product should be able to meet the needs of its customers. This is because an innovative product will only be successful if it can meet the needs of its market. Having the close interaction between the technology and the market is very important to ensure that the product can adapt to the changes brought about by the market. One of the most common mistakes that academic and engineer make is to spend too long in their laboratory. This is because they tend to focus on improving the prototype and looking for a technical solution. Also one of the most important factors that innovation literature has to teach is that a product should be able to meet the needs of its

customers. This is because an innovative product will only be successful if it can meet the needs of its market. Another important factor that innovation literature has to teach is that the development of a new prototype should not be delayed. This will allow the product to get better and faster (Fassin, Y. 2000).

### **3.7 The selection process in the innovation business**

There are many risks associated with innovation, and only a limited number of chances to succeed. The process has several steps, and the costs can increase as the project goes through. While the success rate can be high, the number of projects that get rejected can also decrease. There are thousands of ideas out there that researchers can find. Only a small portion of the ideas get to a first prototype. Only a few of these survive the next step of industrialization or upscale, where they can reach a production cost that's acceptable. Once the product is in the stage of commercialization, the marketing can help transform it into a successful business. The path to success is represented in a figure that consists of two triangles, one with the base on top and the other with the base down (Figure 9). This concept shows the laborious process of developing an idea from concept to commercialization. Only a hundred come up with a prototype, while only ten survive to the industrialization and technical phases to become a ready-to-launch product. The factor ten indicates that one can achieve commercial success depending on the sector. (Fassin, Y. 2000)



**Figure 9**

The triangle that represents the difficult process to achieve success in terms of innovation (Fassin, 2000).

### 3.8 Why innovate?

The 1990s was a time of rapid technological change and social and political change. Many of the terms used during this period, such as globalization, global warming, and the Internet, reflect the issues that people and nations are facing today. History has shown us that there have been two great revolutions in the human race: the industrial revolution and the agricultural revolution. Many commentators believe that we are entering the third wave of change. The agricultural revolution was centered on the farm. Land and labor were the key inputs in the production of wealth. During this era, the exploitation and acquisition of land were seen as a means of wealth accumulation. Food was the most important output of this era. With

the advent of the Industrial Age, the basic inputs shifted to include raw materials, capital, and labor. The manufacturing industry was the main source of wealth accumulation during the industrial revolution. It was driven by the investments made in plant and machinery. (Neely & Hii, 1998).

### **3.9 Innovation and competitiveness**

The ability to innovate is very important to competitive advantage in a constantly changing environment. It can help states develop their economies and improve their competitive position. The ability to innovate is very important for a company to compete at the national, regional, and individual levels. The innovation process can create new values for a company. These values are often manifested in the development of new processes and products. When we consider a company as a bundle of resources, skills, and competencies, then innovation is very important to transform its inner capabilities. This will allow it to be more adaptive and learn from new ideas. There is a growing concern about the UK's lack of effective management of innovation. In 1994, a report by DTI stated that during the 1980s, manufacturing productivity in the UK increased faster than that of other major industrialised countries. However, a report by the DTI revealed that the country's GDP per capita is 10% below that of the Organization for Economic Cooperation and Development. The alarming figure is that the UK's GDP per capita is roughly the same as it was 25 years ago. While other countries such as Singapore and Hong Kong have been able to improve their GDP per capita, the UK has not. (Neely & Hii, 1998).

### 3.10 Barriers to innovation

Due to the importance of innovation, what are the barriers that prevent firms from being able to innovate? According to the literature, there are many external and internal factors that prevent firms from being able to innovate. These include the lack of resources, training systems, and legislation. In addition to these, other factors such as the misuse of talents and the lack of infrastructure are also contributing to the development of barriers to innovation. Some of the internal factors that prevent firms from being able to innovate include the lack of vision, rigid organizational procedures and structures, and lack of motivation. Other factors such as the lack of vision and resistance to change are also contributing to the development of barriers to innovation. These include the lack of information, government support, and the fear of imitation. In addition, the lack of qualified personnel and the lack of support for markets are also cited as factors that prevent innovation. The literature also suggests that many factors can be considered when it comes to promoting innovation in a region. These include the availability of skilled labor, a strong technological infrastructure, and the support for innovation from the public. Despite the various factors that can be considered when it comes to promoting innovation, the process of innovation is still far more complex than most people realize. (Neely & Hii, 1998).

Despite the factors that can be considered when it comes to promoting innovation, the exact methods and strategies to nurture innovation networks are still poorly understood. This is why a wide range of research studies are conducted on the topic. Besides the main forms of networks, the researchers also ask about the governance structure that will allow them to operate. The regional government can play a vital role in promoting collaboration among key players in

order to develop effective networks. This is because the capacity to innovate depends on the ability to form these networks. (Neely & Hii, 1998).

The Diverse degrees of analysis have been used to study the innovation phenomenon. In general, there are three levels of analysis. They can be divided into firm-, regional-, and national-level categories. As for the firm level, it can be divided into three streams, that all have to do with the innovation but they have differences in research question, unit analysis and dependent variable use (Neely & Hii, 1998). The first one is diffusion, the second is organisational innovativeness and third one is process theory studies. Table 1 summarizes the above streams.

Research stream	Question	Innovation stage focus	Unit of analysis	Variables		Research model	Major data collection methods	Illustrative studies
				Independent	Dependent			
DIFFUSION	What is the pattern of diffusion of an innovation through a population of potential adopters?	Adoption	An innovation (extra-organisational focus)	Organisational characteristics Innovation characteristics Promoter characteristics	Diffusion pattern Diffusion extent Diffusion rate	Logistics growth model (based on contagion within the social system and/or 'change agent' influence from without)	Cross-sectional surveys Secondary data	Teece (1980) Easingwood et al. (1981) Norton and Bass (1987) Tolbert and Zucker (1983) Fisher and Carroll (1986) Attewell (1992)
INNOVATIVE - NESS	What determines organisational innovativeness?	Adoption or implementation	Organisational	Organisational characteristics Innovation characteristics Managerial characteristics Environmental characteristics	Innovativeness: - number or - speed of adoptions	Variance / regression models	Cross-sectional surveys	Kimberly and Evanisko (1981) Balbridge and Burnham (1975) Ettlie (1983) Moch and Morse (1977) Meyer and Goes (1988)
PROCESS: STEPS	What are the stages organisations go through in implementing innovations?	Adoption through implementation	Innovation process (Intra-organisational focus)	Innovation characteristics	Stage: - existence and/or - sequence	Stage models	Cross-sectional retrospective surveys	Pelz (1983) Ettlie (1983)
PROCESS	What factors explain the chain of events which result in innovation implementation?	Adoption through implementation	Innovation process (Intra-organisational focus)	PRECURSOR Organisational context -strategy -structure -resources -technological strength Organisational	OUTCOME The innovation process (its stages, sequences, divergent and parallel paths, feedback and feed forward	Process models	In-depth field studies	Dean (1987) Dyer and Page (1988) Schroeder et al. (1989)

**Table 1**

Research streams of Firm Level of analysis (Neely & Hii, 1998).

## CHAPTER 4. Megatrends

Due to the rapid pace of change in the world, it is impossible to predict what will happen in the future. It tends to be avoided making predictions as it is not possible to know what will happen in the future. The future is constantly evolving, and it is where we think our story might be told. The rapid pace of change and the sudden shifts in the world make it more probable that our story will be told in a more impactful manner. The operating system of our world is constantly being changed due to many factors, such as sudden accelerations, disruptions, and the emergence of new technologies. Those who believe in the coexistence of paradoxes believe that their predictions are fulfilled. Unfortunately, none of these come out with a steady release. Even though we are lucky enough to get a glimpse of a major event before it happens, we are also more likely to survive it than those who don't. The rapid pace and unpredictable nature of today's business environment pose a great challenge to executives. They need to keep up with the changes in the market and the changes in their customers' expectations (Esposito & Tse, 2018).

Despite the seemingly random nature of the world's economies, it is still possible to understand and predict the big complex processes that influence how governments, businesses, and societies behave. This is because these are the factors that drive the decisions that are made and the actions that are taken. Despite the complexity of the world's problems, it is still possible to make sense of them. Through research, it has been identified that several points of junction which are the current trends of the world, are likely to affect the events that we are planning for in the future. These elements have significance and can provide us with some clues as to how the world will unfold. Most of the time, the factors that influence society's shaping are only

presented in a minimal manner. However, with this in mind, they have been categorized into five megatrends that are expected to have a significant impact on the future of our society. These include demographic and social changes, resource scarcity, inequalities, volatility, complexity, and scale and Enterprising Dynamics. Although each of these megatrends has its own unique characteristics, they can help us envision a future filled with possibilities (Esposito & Tse, 2018).

The term megatrend refers to a larger-scale phenomenon that can be longer in duration and impact more areas of life than traditional trends or fashions. Naisbitt was the first to introduce this term to the public (Linthorst & de Waal, 2020). He defined megatrends as structural or socio-economic processes that are slowly developing, but eventually become influential once they do. In the early 1990s, he expanded the definition of large social, technological, and economic changes to include events that are slow to develop and have an influence for a long time. This led to the creation of various definitions in the literature (Linthorst & de Waal, 2020). The emphasis is placed on the global impact of a megatrend, which can be extensive and global in all areas of society and life. According to some definitions, a megatrend is a series of interconnected and complex events that can increase the complexity of the multiple systems that are involved in society. For instance, the complexity of the environmental, technological, political, and economic systems can be increased by a megatrend (Linthorst & de Waal, 2020).

## **4.1 Demographic and Social Changes**

The people are the central components of any future state. It is widely known that the world's population is aging and shrinking due to the combination of low fertility rates and high life expectancy. This is also visible if we take a look at the many population pyramids that have

been created. It is an easy and serious effort to visualize how the various segments of the population will be distributed. The concept of the pyramid was originally used to imply that children are more numerous than the elderly in the population pyramid. However, from a glance at the global population pyramid today, it is startling to see how different it is from the 1970s. Despite being the most populous group in the world, children are only marginal units in our society. The pyramid is constantly changing in its shape, and it's not exactly a pyramid at all. According to projections, the majority of the world's population will be over 40 years old by 2030. In developed economies, Japan, Germany, and Italy are expected to reach an average of 52 by then. On the other hand, in developing economies such as China, the number of people over 40 years old is expected to increase. Although most emerging economies are still young, the majority of them are in the sub-Saharan region. For instance, in 2013, the average age of Nigerians was 15 years old. By 2030, it will be 15.2. This demographic shift can have a destabilizing effect at best. Due to the increasing number of elderly people in the developed world, the challenges that the developed countries will face in maintaining and funding their social security systems will be more significant (Esposito & Tse, 2018).

Developing nations will also have to step up their efforts in providing adequate education and health care to their young population. The global population is expected to plateau for the first time in history due to the increasing number of people getting older. This is a worrying sign that the labor power will not be able to support the growing number of old-age individuals. The shrinking labor pool is the only way to maintain the country's economic growth. To do so, the government should invest in improving competitiveness and raising productivity. This can be done through the use of different economic models that do not rely on excessive factors of production. Liberalized business and economic policies are needed to ensure that the country's

industries are not only competitive but also free from excessive factors of production. This can be done through the use of a modern fiscal system that distributes taxes to various public services and logistics (Linthorst & de Waal, 2020). Unfortunately, governments are more likely to impose trade barriers and adopt short-term austerity measures instead of investing in improving productivity. This shows that they are not committed to making the future better. As people get older, they are more likely to move into cities. The increasing number of people living in these areas is considered to be beneficial for the development of the country's gross domestic product. Urbanization has been shown to have a positive effect on the country's economic growth. It is also expected to lead to the emergence of megacities, which are areas with a population of over ten million people. Contrary to popular belief, midsized cities are more likely to contribute to the development of the nation's economy than their bigger counterparts. Regardless of the size of the cities, the trend toward urbanization can provide multiple benefits. It allows the labor force to be more concentrated and the infrastructure to be more connected. The rise of logistics platforms and the increasing connectivity between cities are also contributing factors to this trend. The rise of people employed leads to higher income, which in turn fuels consumption. Urbanization often creates clusters around cities, as well as the creation of production hubs that are much larger than those in the regions themselves. The good news for companies is that they can reach more customers by reducing their incremental costs. Unfortunately, this information is often not prioritized by executives. For instance, they don't have a good understanding of how urbanization is affecting labor force and migration (Linthorst & de Waal, 2020).

## 4.2 Resource Scarcity

The concept of resource scarcity refers to the increasing demand for various resources such as food, energy, water, and minerals. Due to the rapid growth of global consumption, the need for these resources has become more scarce. This has led to higher costs and the emergence of new megatrends. Changing the way organizations work and innovate will be key to ensure that they can survive in the future. Society will also require leaders to minimize the negative effects of their actions on the environment and society. The concept of resource scarcity is a megatrend that's expected to continue. People tend to relate it to energy scarcity, thinking that the world will run out of fossil fuels soon. Although fossil fuels are not renewable, they can be replaced with other energy sources such as solar and wind energy. According to the literature, the main issue is the lack of water. This is because water is used in various processes, such as the production of food (Linthorst & de Waal, 2020). There is a huge amount of energy reserves that are yet to be inventoried. Also, due to the effects of climate change, solar and wind energy have become more available. Despite the expensive nature of these energy sources, we believe that the world is not at risk of running out of energy anytime soon.

On the other hand, food and water are two different stories. According to the World Wildlife Fund, by 2025, it is estimated that around two-thirds of the world's population will experience water shortages. This is because the current consumption rate is not enough to meet the needs of the growing population. In addition, the increasing number of cities will put additional pressure on the water supply. The scarcity of water would have a significant impact on the value chains of companies, especially those operating in regions where manufacturing is still the main driver of production. It could also cause food production to be affected by the lack of

water. Because of the rising demand for meat and dairy products in emerging markets, the need for water is expected to increase significantly by 2050 (Esposito & Tse, 2018). After the increase in demand for food, its prices are expected to rise. According to a study, rising food prices will have a significant impact on the personal income of people in developing countries. Despite the pressure on food and water, our economies and societies have been strangely wasteful. According to the European Union, over 30% of the food that goes to waste is thrown away by consumers. In vegetables and fruits, 46% of the edible mass gets lost. The lack of resources to grow new products has highlighted the need for a new approach to sustainable food production. The concept of the circular economy, which is also referred to as the "cradle-to-cradle" model, is gaining more traction as the framework for the future. It is hoped that this will allow for a more sustainable and regenerative approach to production (Esposito & Tse, 2018). Unfortunately, if the world continues relying on waste as a means of production, the scarcity of resources will continue to be severe.

### **4.3 Inequalities**

The rising inequality between the rich and the rest of the population is a growing concern. Although employment rates have increased globally, there are still groups of workers who are not receiving adequate compensation. These include low-skilled workers, those with a migrant background, and self-employed individuals. The gender gap is also not expected to disappear soon. The increasing number of vulnerable employees creates a need for effective social protection measures. These include providing them with legal protection and flexible working arrangements. Increasing inequality in business can have a negative impact on the operations of companies. There will be an increase in the number of policies that are aimed at protecting

vulnerable employees and eliminating inequalities in the workplace. This will require organizations to provide training programs and provide better working conditions for lower-skilled workers. In addition, they will have to demonstrate that they are following the new legislation. This legislation could also result in an increase in the administrative burden of the organization. It could also result in an increase in the administrative burden of organizations (Linthorst & de Waal, 2020). Despite the similarities between the rise of income and the decline of middle class workers, it is not clear what the difference is between age and inequality. One clear indicator of this is youth unemployment, which continues to go up in various parts of the world. According to the International Labor Organization, around 30% of the young people between 15 and 24 years old in the Middle East and North Africa are not in school or have no training. In Greece, half of the youth are out of work. In the US, the youth unemployment rate is around 16%. This is typically because there aren't enough jobs available. Other times, government policies favor the older population. It's an indication that the country's economic infrastructure is reaching its capacity.

There are many grave conditions of life, such as income, social, and age inequality. However, there is also a strong case for another type of inequality, which is known as capital inequality. It does not directly correlate with income inequality, although it could be close. The preference for debt over equity in Europe has made matters worse. As a result, it is unlikely that the region will be able to support the growth of new start-up businesses or entrepreneurship in many cities unless a broader set of investors regains their aversion to risky shares. According to Philippe Cerf, a senior managing director at Credit Suisse, Europe's lack of support for entrepreneurship can be seen in the multiple start-up hubs in Berlin, London, and Stockholm. The widening inequalities in our societies could have a significant impact on the future of our

country. Even with the minimal effort that has been made to stop them, they could still have a significant impact on our society's trajectory (Esposito & Tse, 2018).

#### **4.4 Volatility, Scale, and Complexity**

Despite the technological advancements that have occurred over the past two millennia, the world has not been a very exciting place for economic growth. The Industrial Revolution led to the growth of the global economy during the mid-eighteenth century. Following the invention of steam power, the rise of electricity, and the introduction of household plumbing, the world's economy grew significantly during the next century. The rise of Internet technologies has caused productivity and the economy to take off once more. In 2011, Jeremy Rifkin talked about a third industrial revolution that will involve the merging of existing engines and platforms. He noted that this will happen when the various drivers of mobility, communication, and energy combine. The powerful and unique characteristics of the online technology are its ability to act as a glue that connects many technologies and devices. This is why it is different from other revolutionary innovations that have been presented in the past. The World Wide Web, which is regarded as one of the most significant technological inventions in history, is merely a “kit-bash” of technologies. For instance, it is composed of a simple transmission network protocol, a computer language, and a browser. The combination of these technologies can create new opportunities for various industries. For instance, if not for the appearance of wheels, various technological innovations such as railways and horse-drawn wagons would not be possible. The rapid emergence and evolution of Internet technologies has made many activities, previously unfeasible, incredibly scalable. These new practices could make our world more unpredictable and complex. One example is the evolution of communication over IP, or voice over IP. This allows software

companies such as Microsoft and Google to bypass traditional physical infrastructure by providing free voice communication. Despite the factors that influence the development and use of computing, the acceleration of the technology is still slowed down by the Moore's Law. This does not mean that the end of computing is near. It means that the price of computing power will not halve every two years. Due to the increasing number of components being placed onto a single chip, the slowdown in the technology's development has been attributed to the physical limit of how many parts can be added to a single chip. This means that the future of computing will not be about just power. Instead, it will be about making the most of the available resources and choosing the best possible combination of performance and power. As more companies start to explore the possibilities of connected products, we expect that they will also start looking for new ways to connect and interact with their products. This is referred to as the Internet of Everything. It is a concept that was coined by a former CEO of Cisco, who referred to it as the Internet of Things. The concept of the Internet of Things is an extension of the old Internet, which is about analyzing patterns and collecting intelligence. For instance, Amazon is considering using drones for its delivery. Similarly, ride-sharing service Uber is exploring the use of autonomous cars. The rise of advanced sensors has also led to the development of robots that can interpret and sense the world around them. The rise of cloud computing has also led to the development of robots that can learn all by themselves. This eliminates the need for individual entities to learn on their own, which can lead to faster developments. The rapid emergence and evolution of robotics could create new ecological opportunities. Because of the complexity of the technology, businesses would need to be adaptive to adapt to the changes brought about by the rapid development. (Esposito & Tse, 2018).

## 4.5 Enterprising Dynamics

The evolution of technologies has not just changed the way we live, they have also changed how businesses work. This is evidenced by our research on the volatility of markets. While the research shows that the traditional approach to managing risk is still prevalent in some parts of the world, other regions are starting to contextualize the technologies that are used to serve their local markets. The rise of China's economic growth is partly attributed to the country's desire to assimilate Western products and the increasing number of fake goods being sold in the country. This is a common theme among people who confuse innovation with invention. Despite the country's poor record at coming up with new ideas, it is still important to note that it has been doing business with a wide variety of novelty products that Western companies should take into account. Despite the technological advancements that have occurred in Japan and the West, Chinese firms are still able to excel in their respective fields by focusing on their customers' needs. For instance, in 2011, Xiaomi, a mobile phone manufacturer, launched its first product. By 2014, it had already become one of the largest mobile phone companies in China. It is easy to discount the success of a company due to how it can sell its products as cheap alternatives to Apple's iPhones. After all, the iPhone 5 costs around \$860 in China, while the flagship model of the company, the Mi-3, costs around \$330. However, this is not the company's most important success factor. The company's ability to serve its customers is more important than its ability to make products. Through its feedback and suggestions, the company updates the operating system of its phones every two weeks. It also offers various services and apps to cater to its customers' needs. According to a 2015 article by Tse, the Chinese company is more like Amazon than Apple. In 2015, China's e-commerce giant Alibaba launched a financial services arm that will allow small and medium-sized enterprises to access the company's online platform.

Although this might seem trivial at first, it's important to note that the US and UK regulators would likely prevent online platforms from extending their operations into financial services without facing competition from their traditional counterparts. Due to the technological advancements that have occurred in the West, many companies are now taking on new entrepreneurial roles. For instance, a translation company in London is now an IT integrator. This type of company is able to provide a small amount of translation services. Also, due to the increasing number of multinational companies that require translation services, many companies are now adopting the use of software and computers to automate the process. For instance, if a company wants to translate all of its invoices into different languages, it requires the translation company to do so. While the business model may be new, customers can modify it to their liking. For instance, they can add a new dimension to it by making it more interactive. For instance, by using crowdfunding, an entrepreneur or start-up can raise funds from individuals. Instead of going to the bank or investing in institutional investors, these individuals can fund their company through an online platform. In addition to being able to borrow money, companies can also sell their ownership in order to make money. For instance, Compte Nickel, a French company, allows customers to access international bank accounts and an ATM card without the need for a bank account. The company was able to capitalize on the success of Kenya's M-Pesa, which was a mobile banking system that was very popular in the country. According to Paul Lee, the CEO of Aumeo Audio, the growth of crowdfunding is not only due to the need for funds, but also because it allows entrepreneurs to test their ideas and develop new products. For instance, by simply listing their product online, anyone can easily see if there are takers. If there is no demand for the product, it means that there is not a market for it. In the past, it would have been very difficult to determine if there was a demand for the product until it reaches the stage where

it can be sold to customers. However, with the help of crowdfunding, it can be easier for entrepreneurs to start developing their ideas and find sales channels. In addition to coming up with a concept, the entrepreneurs also have to conduct market research and find other businesses to partner with. Through the help of crowdfunding, it can be easier for entrepreneurs to start developing their ideas and find sales channels. In addition to coming up with a concept, the entrepreneurs also have to conduct market research and find other businesses to partner with. Due to the increasing number of businesses operating online, it is expected that the value chains and business models will undergo more rapid changes in the future. (Esposito & Tse, 2018).

#### **4.6 Other megatrends in the business field**

Apart from the megatrends that have previously been discussed, there are other megatrends that have a tremendous influence in the business field. More specifically, one megatrend that matters in business is the speed of technological advancement. The term technological advancement refers to the development of digital tools and technologies that help improve the efficiency of organizations. These include advanced analytics and automation. According to the literature review, the rapid pace of these changes was the most frequent megatrend. For decades, organizations have been automating their work. However, due to the increasing speed of technological change, it is now becoming more common for them to adopt automation. The concept of Industry 4.0 is centered on technological advancement. It is a framework that aims to discuss the various aspects of automation and digitalization (Linthorst & de Waal, 2020).

Industry 4.0 is composed of nine pillars. These include the development of big data and analytics, which will allow organizations to make better decisions and improve their efficiency. Then we have the emergence of autonomous robots can learn and perform certain tasks and the development of horizontal and vertical systems integration, which will allow factories to be more productive. Also, the cloud will allow work to be done through a shared platform and the use of 3D printing will allow companies to customize their products and services. Last but not least we have the cyber-security awareness, that will help prevent organizations from being targeted by cyber-attacks. Artificial intelligence and robotic systems are forcing people to work side-by-side with machines, which is also creating new roles for workers.

The rapid emergence and evolution of technological advancements has the potential to have a negative impact on the operations of organizations. According to the literature, the increasing automation of tasks will lead to the reduction of the number of employees and the fear of job loss. This will also cause the mismatch between the skills that employees provide and the requirements of the company. The increasing number of employees working from home will require new leadership styles. This will require the learning of new skills in order to manage the various operations of an organization. Besides the automation of tasks, other factors such as the way employees collaborate will also require the learning of new strategies. In addition to the automation of tasks, other factors such as the way employees collaborate will also require the learning of new strategies (Linthorst & de Waal, 2020). This will require the training of new employees and management on how to use technology effectively. Besides being able to use technology, it is also important that employees are equipped with the necessary knowledge to face the challenges of the future. Because of the rapid emergence and evolution of technological

advancements, it is important that organizations continuously update their external communications to ensure that they are up-to-date with the changes.

Another important megatrend is the flexibility in employment. A flexible employment contract is a type of work arrangement that allows employees to work from different locations and time frames. It is also expected that the traditional nine to five job will decrease in favor of on-demand and mobile employment. Employees will no longer need to go to the same location after the Covid-19 pandemic. In addition, there will be a rise in flexible employment contracts that allow employees to work from multiple positions within an organization. Flexible employment can have a negative impact on an organization's operations. It can cause a decrease in the number of employment contracts and a rise in the number of self-employed workers. This could lead to less loyalty and insecurity among employees. It's also widely believed that workers will have multiple contracts with different organizations at the same time, which could result in more burn-out and difficulty in meeting the demands of their work. There will also be a rise in the number of flexible working hours and working at different times, which can require more complex management styles. In addition, flexible employment can cause shorter tenures for managers and employees, which could decrease employee engagement and work-life balance. It can also lead to fewer workers physically being present in the office. This could require changes in the way employees work (Linthorst & de Waal, 2020).

It is also important to consider the sustainable employment as a megatrend. The concept of sustainable employment refers to the willingness of workers to continue working in the future. It is about providing a work environment that is conducive to the well-being of employees. There is a rising concern among management about the lack of sustainable employment in Western

countries due to the aging population and the increasing awareness of the need for more sustainable practices among the clients of the organization. The increasing attention that organizations have on sustainable employment can have a positive impact on the well-being of their employees. It can help them recognize the importance of aging at work and staying healthy. In addition, it can help them provide a safe working environment and accommodate workers with special needs. Being able to provide meaningful and challenging jobs can also help workers develop their self-esteem and confidence. In addition, increasing attention paid to gender equality and equal pay can help boost the awareness of the workforce. To ensure that their employees are satisfied and stay in their job, organizations must also take various measures to improve their work environment. These include increasing their flexibility, developing a workforce that is representative of their needs, and ensuring that they are able to provide a variety of work opportunities (Koh & Leong, 2017).

In addition, it is extremely important for the workforce to adapt the skills that they need for the future business models. In other words, the skills mismatch is an issue that needs to be resolved. The skills mismatch is a phenomenon that occurs when the current workforce doesn't have the necessary skills to meet the needs of the future employers. It is a common challenge that organizations and employees face when it comes to preparing for the changes brought about by the rapid pace of change in the workplace. The importance of continuous learning is also acknowledged by organizations and workers to ensure that they are ready for the changes brought about by the rapid pace of change in the workplace. This is because the future of work is no longer about merely having a college degree. It requires the skills to perform specific tasks. The rapid pace of change has also prompted the recognition of the importance of various skills such as critical thinking, entrepreneurship, and adaptability. This is why it is important that

policymakers and education systems are equipped with the necessary resources to support the development of new skills (Koh & Leong, 2017). The effects of a skills mismatch on an organization can be summarized in the following ways. According to the literature, an increase in the number of workers with the wrong skills will result in a shortage of workers and a surplus of employees with the skills that are needed to meet the requirements of the future employers. This will prevent the organizations from achieving their goals and ensuring their continuous existence. In addition to investing in the training of their employees, organizations also need to increase their investment in other programs and activities designed to support the development of new skills.

Let's not forget about the environmental issues as a megatrend that has an impact on many industries and businesses. Climate change is a phenomenon that's caused by human activity and its consequences. It can affect the daily lives of people around the world. Natural disasters and floods are some of the impacts of climate change. The effects of climate change are expected to have a negative impact on the global economy. It's estimated that investments needed to address the issue will need to be made in order to reduce the ecological footprint of businesses and individuals. In order to minimize the effects of climate change on the business environment, it's important that organizations adopt a triple bottom line strategy. This concept aims to encourage sustainable value creation by focusing on environmental and social concerns. Due to the effects of climate change, more people will become aware of the importance of sustainable value creation and the need for governments to enforce regulations. This will require continuous innovation and the use of resources to minimize the impact of processes on the environment (Koh & Leong, 2017).

Another big issue is the continued globalization. The process by which businesses or organizations expand their international reach is globalization. It involves either establishing an international presence or integrating with people and governments all around the world. Although it is not new, it is still considered a megatrend in the literature. The term globalization had a significant overlap with the terms technical advancement and flexible employment. This suggests that there is a link between the three (Fedotova, 2018).

The urbanization as a megatrend has a minor role to the business field. Although it rarely appears in the work literature, megatrends urbanization is still widely acknowledged. This phenomenon refers to the shift in the population from rural areas to urban areas, which is caused by the increasing number of people living in small cities and metropolitan areas. Urbanization has an impact on organizations in both urban and rural areas. According to the literature, this can be summarized as follows: The lack of qualified workers in rural areas can lead to various issues such as organizational problems and higher costs of living. On the other hand, in urban areas, the overpopulation can cause various issues such as a lack of jobs and a more hectic lifestyle. The rise of urbanization can also provide opportunities for both non-skilled and skilled workers. In Asia and Africa, for instance, it can boost the competitiveness of local economies by providing them with the necessary infrastructure and services. However, some experts warn that the lack of proper management and financing of cities could lead to social and economic crises (Friesendorf & Uedelhoven, 2021).

Lastly, it is wise to consider cross border migration as a megatrend that also influence businesses. The term of cross-border migration refers to the process of employees moving to a different country in order to find better work. It is a natural consequence of the world's shortage

of skilled workers, as countries are not able to provide them with the necessary skills to compete in the global economy (Elo & Riddle, 2019). Cross-border migration can affect the composition of the workforce and cause social issues. It can also lead to higher unemployment rates for migrants, especially those from non-Western backgrounds. The effects of cross-border migration on the composition of the workforce are also known to be significant. It can affect the skills and knowledge of the migrants in their home countries, which are often affected by political and environmental issues. For instance, in Amsterdam, there are many workers from Ukraine who are contributing to the country's job gaps. The concept of economic migration, where workers are far away from their families and friends, is not sustainable. This type of migration can also lead to higher unemployment rates. To minimize the effects of this practice, organizations should start preparing for a more diverse workforce (Elo & Riddle, 2019).

#### **4.7 Industry 4.0 frameworks as a megatrend**

Despite the technological progress that companies are making, they still maintain a balance between society and business. Sustainability is a vital part of their operations because it helps protect the environment. In the future, the strength of business will be in the use of cyber-physical manufacturing. The core of smart factories is a cyber-physical manufacturing system (CPPS), which is designed to control the physical processes of a company. Through the use of the Internet of Things (IoT), and cloud computing, companies can access real-time data and make informed decisions. In today's world, machines and automations are taking over the tasks that humans perform. The concept of Industry 4.0 is a set of technologies that are used in various processes, such as manufacturing, logistics, and IT. In 2015, (BCG) introduced nine technologies that are designed to help companies improve their operations and make informed decisions.

These include artificial intelligence (AI), big data and analytics, autonomous robots, cloud computing, cybersecurity, vertical and horizontal integration, and virtual reality. The many technology pillars of Industry 4.0 are categorized into sub-pillars. These are the tools and applications that are used in the various processes of the industry. (Gajdzik, Grabowska & Saniuk, 2021)

Klaus Schwab (2016) presents the various technological trends that are shaping Industry 4.0 in three clusters: physical, digital, and biological. The first group includes the automation systems, industrial robots, and 3D printing machines. The second group includes the sensors, data processing systems, and autonomous vehicles. The second cluster, which is called the digital cluster, is composed of computer systems and the Internet. It also includes various data processing and data collection systems. Some of the key technologies that are part of this group include the Internet of Things and the Internet of Services. The third group is composed of technological solutions that enable the interaction between humans and machines. These include facial expressions, gesture recognition, and voice recognition. Industry 4.0 is a framework that aims to bring together the various trends that have already been used in the market to create new ideas. The most important factors that influence business functioning are the globalization of economic activity, the emergence of strong capital groups, the spread of digitalisation and information technology, the increasing importance of knowledge, and the state's influence on the economy. They also list other factors such as the increasing number of employees and customers, the rise of social expectations, and the need for continuous change. Today, people are living in an open society where the freedom gives everyone the opportunity to transfer everything. The rise of globalisation and the development of information technology are two of the most important factors that have affected business. An information society is a type of organization

that can process and use information. Due to the technological advancements that have occurred in the field of information technology, it is now transforming into a digital society. (Gajdzik Grabowska & Saniuk, 2021)

A strong trend is digitization. Digitization is a process that involves converting old analogue information into digital form using electronic devices. This allows data to be transmitted, stored, and processed through various means, such as hardware, net-works, and digital circuits. According to Stolterman and Fors, digitalisation has led to the creation of numerous digital products and services that have improved the quality of life. According to Bloomberg, digitalization has allowed companies to improve their efficiency and effectiveness by allowing them to combine their various business functions. This process can also help them implement new processes in their value chain. Aside from improving the efficiency of their operations, digitalisation has also led to the creation of new products and services. The rapid emergence and evolution of the digital economy has led to the strengthening of society's functioning. According to Tapscott, the increasing number of digital technologies has led to the development of a more integrated and productive relationship between producers and consumers. This is why the consumer is now a key player in the market. The rise of technological trends has created a new generation of people who are more open to change and confident. They are also more likely to develop emotional intelligence. The concept of "greyness" has been replaced by "colourfulness." According to Drucker, management is about people. It is embedded in culture, it requires a simple and understandable set of values, and it should lead the organization to be able to learn. It should also be focused on the most important outcome, which is a satisfied customer. In addition to being able to communicate clearly and effectively, management should

additionally be able to make the organization's goals and procedures more effective. (Gajdzik Grabowska & Saniuk, 2021)

The state's role in the development of organizations and people is becoming more significant as the emergence of Industry 4.0 and the increasing number of technological innovations bring about new opportunities. In addition to the technological advancements that are expected to be implemented in the field, the concept of sustain-ability is also becoming more important. During the second half of the 20th century, the concept of ecological innovation was introduced. This type of innovation focuses on the reduction of harmful effects on the environment. Although they are different from one another, their common feature is that they help reduce the negative impact of the environment. The concept of ecological innovation involves the various stages of a product's life cycle. It takes into account the design, production, consumption, and management of a product. This concept is referred to as a departure from a linear economy, which means that waste is typically treated as the last stage of the life cycle. In a closed-circuit economy, waste should be treated as a secondary raw material. This is the purpose of all activities prior to the creation of waste. The goal of a closed-loop economy is to increase the innovation capabilities of European companies and make them more competitive in the global market. This concept is also beneficial for European entrepreneurs as it allows them to develop their skills and knowledge in the areas of manufacturing and design. According to a study conducted by Wittenberg, employees are often characterized by a disruptive mentality. They are more likely to think critically and creatively than before. In addition, they are more likely to develop innovative ideas. The concept of Industry 4.0 is also driven by the openness of new solutions. The concept of personalized products is also driven by the demands of the customer. Through the process of personalization, a company can create a product that fits to the

needs of its customers. The production of the product is carried out through the involvement of its customers. The customer designs the product, follows its manufacture, and makes the choice of after-sales services. Modern IT technology allows companies to take into account the varying wishes of their customers at every stage of the production process. The success of personalization can then be transformed into mass production, or it can be affordable and personalized products similar to mass production. The affordability of these products is determined by their production costs. Through the use of Industry 4.0 technologies, companies can also identify their customers and offer them customized products. Through the use of Industry 4.0 technologies, companies can improve their productivity and flexibility by allowing them to meet their customers' orders more quickly. One of the most important factors that a company can consider when it comes to implementing this technology is the speed at which it can meet its customers' orders. For many years now, manufacturing companies have been able to improve their flexibility by implementing process orientation. This is because they are able to function in a network world, which is composed of various networks. These include networks that are related to work, communication, and knowledge. According to Reed and Eck, in 2014, the advantages of a collaborative network are its ability to adapt to changes in the industry and its flexibility to allow companies to implement new systems easily into their existing facilities. The members of the network are interconnected "neurons" on paths of connections. The network can change and adapt to meet the needs of its customers, such as the availability of raw materials, technology, and the availability of other services. Each company can be a power center within the network due to the criterion set. Instead of hierarchical solutions, the concept of neural networks is an alternative to traditional hierarchical structures. In Industry 4.0, virtual organizations are commonly used. In rigid networks, companies are responsible for their own

autonomy. In Germany, the industry expected to invest about 40 billion euros in Industry 4.0 over the next five years. The same level was applied to the European industrial sector, and the annual investment was expected to reach 140 billion euros. The various technologies that are part of Industry 4.0 are being used in many businesses, such as manufacturing, commerce, and services. Some of these include the use of databases and artificial intelligence to monitor the flow of products and services in the supply chain. In addition, they can support the development of personalized customer service by using chatbots and mobile marketing. (Gajdzik, Grabowska & Saniuk, 2021).

## 4.8 Why Megatrends Matter

The rapid pace of change that occurs throughout a company's life cycle can affect its ability to adapt to new opportunities. To keep up with the changes, you have to make significant investments in resources. This is similar to the Red Queen's strategy in the novel "Through the Looking Glass." Getting ahead of the curve can help you and your company plan for the future. It can also help keep you and your team focused on the important tasks at hand. The five megatrends of the Drive Framework clearly show that our economic future is predictable, but it is also correctable in the case that these trends threaten our sustainability as a society and planet. Despite their differences, economies around the world are still affected by the same trends. By paying attention to the Drive Framework, individuals, governments, and companies can gain a better understanding of the changes that are expected to affect them in the future. (Esposito & Tse, 2018).

Some of the trends of the last decade:

-China as an emerging super power

-Internet retail and e-commerce

-Social networking

-Green and sustainability

It would seem that most of the trends that were identified ten years ago were already in place. If we look at the changes that have occurred in the personal and professional lives of people over the last five years, it is surprising to see how much has changed. Due to the digital pressure, the publishing and e-commerce industries are trying to transform themselves into new business models. Some of the companies that have been able to create leadership positions by being early adopters of new trends are Siemens. Also due to the new technologies and the increasing number of people using social media, Facebook has been able to create a dominant position in the e-commerce and publishing industries. The failure of green technology to deliver a predictable and manageable Return on Investment has led to a shift toward the use of intelligent products and services. This will allow cities and companies to adopt a more eco-friendly approach to their operations. The megatrend of the last decade, which was mainly focused on green products, will be replaced by the use of smart services and products. To some people, being "green" means being conscious of their environment and reducing their carbon footprint. Some of the most common ways to do this include: switching off your lights when you leave the room, using a more energy-efficient bulb, and investing in solar heating panels. "Smart" products are all about efficiency and not about changing one's habits. Unlike green products that have no defined payback period, these products have a proven business case and can provide

substantial savings. They can also boast a typical two to four-year return on investment. The concept of Smart has already been used to describe various products and services. Some of these include smart cities, intelligent buildings, cloud computing, smart homes, smart cars, smart materials, and smart governance ( Singh, S. 2012).

## 4.9 Defining SMART

There are many definitions of "smart", and the evolution of the term has been influenced by various factors. For instance, from a device that was connected to the Internet to a product that has an embedded intelligence, the concept has evolved. Most current definitions of smart products refer to them as smartphones, which are essentially devices that have an embedded communication and information technology.

Most people believe that smart products are headed in the direction of being more intelligent. However, this is not entirely accurate. There are actually three levels of smart products.

Level 1: These are products that have a basic sensing mechanism and can communicate with their surroundings.

For instance, smart bandages can be equipped with sensors that can inform the doctors and patients about the development of an infection. These could also be used to identify the bacteria causing the wound.

Level 2 products are those that can collect data and perform corrective actions using embedded software. For instance, a smart lighting controller can be used to turn off the lights

when it senses that there are no people in the room. It can also switch on and off the lights automatically if one enters the room.

Level 3 products are those that have advanced capabilities and are able to collect data and perform corrective actions using an embedded intelligence. These include products that are part of a connected network.

A Level 3 smart lighting controller can perform various functions, such as regulating the intensity of the light in a room. It can also keep the lights on and off according to the natural light levels in the room. It can be remotely controlled using a smartphone. This feature can be useful if you have a hard time remembering to switch the security lights on while you're away on a holiday.

In the future, the concept of smart products will be moving away from standalone devices to a more integrated approach that includes smart homes, cities, and smart buildings. This theory is presented in Figure 10, where it shows potential depictions of smart products in the future.

Companies such as IBM and Siemens are working on creating a framework that will allow them to connect various sources of information to provide users with the most accurate and timely information. For instance, if you are driving to work, you might want to know when the next traffic jam will occur and where it will be ( Singh, S. 2012).



**Figure 10**

Depictions of smart products in the future (Singh, 2012).

### **4.9.1 SMART ENERGY AS A MEGATREND**

Only 30% of African households have electricity. By the end of this decade, this will change and the continent will no longer be referred to as the blackout continent. In India, 40% of the country's population still lives in homes without electricity. China has become the world's largest consumer of electricity. As developing regions around the world look to generate more power, they are focusing on meeting the needs of their growing population, which is demanding

more power to run their refrigerators, washing machines, and televisions. The transmission and distribution of electricity has been a long time coming. In North America and Europe, for instance, the networks have been around for over a hundred years. When it came to the transmission and distribution of electricity, power grids were built to carry it from remote locations to cities. They were not concerned with the potential loss of electricity. There was also a lack of concern about the potential for electricity to be lost in the process. The increasing cost of electricity has caused the losses in the transmission of electricity to increase. This has also increased the amount of emissions that are generated by the electricity that's never used. Renewable energy sources and the production of localised electricity can help cut down on emissions and lower bills. One of the most effective ways to cut down on emissions is by implementing a Smart grid. This will allow consumers to use the electricity they consume more efficiently. Unfortunately, high consumption levels around the world are threatening the existence of non-emission fuel sources such as solar and wind energy. In addition to implementing a Smart grid, other steps need to be taken to increase the efficiency of electricity transmission and distribution. For instance, people should improve the efficiency of their homes and buildings ( Singh, S. 2012).

#### **4.9.2 Other cases that define the future**

##### *Virtual dollar: Invisible good, visible me*

In November 2011, social gaming company, Zynga, announced that it would be going public. The company's value was expected to be around \$7 billion. It has a unique business model that relies on the popularity of Facebook. Its clever pop-up ads allow users to spend real money in virtual currency for their games. This concept accounts for a huge portion of the

company's revenue. If we extend this concept to a location-based business model, then it would be very interesting to see how companies can benefit from this type of business model. In the future, we would be able to receive notifications to spend real money on virtual items or earn loyalty points by looking for the "here and now" concept. These micro-transactions can also include the sale of virtual goods or personalized applications based on the location of our customers. ( Singh, S. 2012)

### *Augmented social networking: I connect with people I see*

Now, augmented reality (AR) can be used to enhance geo-social interaction. It will allow users to collect and view information about their surroundings, such as their locations, activities, and interests, while they're in a certain area. This technology could also help users identify their potential new friends in the area. For instance, if a person is walking around a certain area, their virtual eyes will be able to see their surroundings and provide them with relevant information. Through AR, you can now see the sales notifications on your favorite products while you're in a certain area, such as in a shopping mall. You can also receive a social alert if a potential business contact is sitting at the Starbucks next door or is above a floor. Finally augmented reality will allow people to easily visualize their geo-social interactions, which will enhance the fun levels of their daily routine. This technology will also help people connect with their friends and family more easily. ( Singh, S. 2012)

### *Online communities: Together we influence*

The innate urge to share, collaborate, and imitate others has inevitably led to the development of social networking sites. Online communities or blogs are collections of strong

ideas and interests that come together to form a common purpose. Some of the most popular forms of social networking are microblogging, blogs, and wikis. Due to the nature of social networking sites, they have transformed into platforms that allow individuals to interact with each other and form a common purpose. For instance, a community can now become a marketing forum or a support group for a particular service. ( Singh, S. 2012)

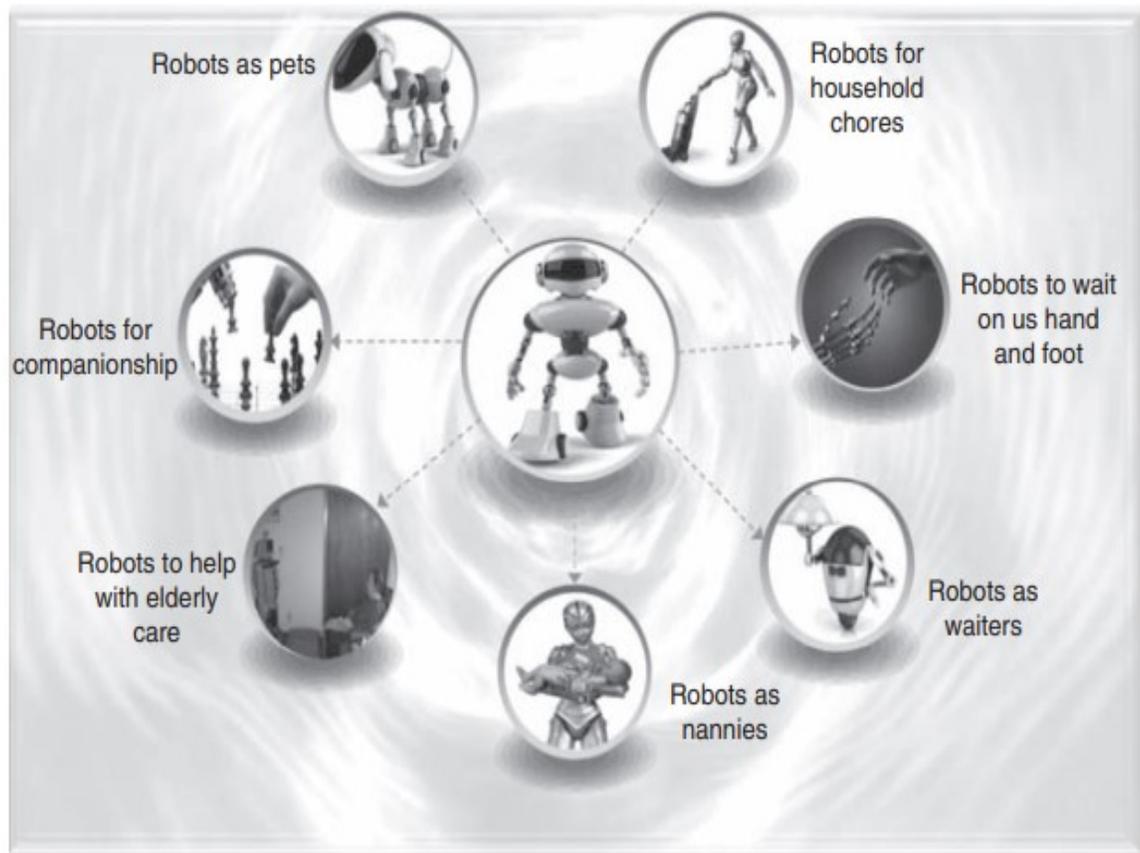
### *ROBO-SLAVES*

Although President Abraham Lincoln helped to end slavery in the US during the Civil War, it will be back by the end of this decade. In addition to being servants in our homes, these slaves will also be able to perform various tasks, such as cleaning and cooking. They will be developed using artificial intelligence and robotic technology. This theory is presented in Figure 11, where it shows some potential applications of robo- slaves in everyday life.

According to the US army, by 2030, about 30% of its soldiers will be robotized. Although these statements are far-fetched, it's still expected that we will start seeing the first applications of these machines in our homes by the end of this decade.

A development in this particular field is the ASIMO robot. The ASIMO robot was first developed by Honda in 1986. It was officially introduced to the world in 2000. Honda's ASIMO robot was first developed in 1986. It was officially introduced to the world in 2000. It took Honda engineers around 10 years to fully develop ASIMO, which was initially introduced in the mid-1980s. Its latest iteration, which was showcased in 2011, has developed well during its formative years due to the development of an artificial intelligence framework that allows it to make independent decisions without requiring an operator. In the future, robots could play a vital

role in our lives, as they could assist people with special needs in many ways. For instance, by developing devices that help people walk, Honda could be contributing to the development of a more mobile society. The development of robotic technology started during the 1950s to the 1960s. Today, it is helping humans in various sectors such as transportation, manufacturing, and space. In the manufacturing industry, robots have greatly reduced the number of injuries and defects that have been reported. In the automotive industry, robots have greatly improved the quality of car manufacturing by allowing them to create more precise and almost zero errors. In the medical industry, they have helped perform various procedures such as minimally invasive surgery and robotic surgery, which can be performed up to 200 miles away from the patient's bed. In the wars in Iraq and Afghanistan, robots have been able to make significant advances in the battlefield. One of the leading producers of military robots is QinetiQ, a British defense and technology company. Its TALON robots have been used to detect and remove mines. QinetiQ displays the capabilities of its robots in order to impress its customers. For instance, when it marketed its Dragon Runner robot to the Canadian army, the company organized a show for the public. During the event, the robot made its way through the embassy's hallways and into the theatre dais. It greeted the ambassador of Canada. The robot demonstrated its dexterity by dropping a hockey stick into the ambassador's hand. The Canadians were so impressed that they immediately ordered the robots ( Singh, S. 2012).



**Figure 11**

Examples of future Robo – slaves in everyday life: This type of technology (robotic) will be present in 2030 (Singh, 2012).

*Shift in health care services delivery to outside hospitals*

Due to the lack of trained and experienced staff members, the power of non-clinical homecare will increase significantly in the future. It costs around \$620 for a hospital consultation in the US, while it is much higher for older people. Governments can help address this issue by providing adequate funding. The evolution of home health care will continue to be driven by the increasing number of services that are available online and in-home. Some of these include

consultations, disease management, and vital-sign monitoring. In Scandinavia, for instance, the concept of remote/home monitoring has been widely used. This method allows patients to receive their test results directly from their doctor. In addition, some countries, such as the UK, provide for the provision of personal health budgets that are based on the individual's needs. This method can be very beneficial if you live in a country that provides for your health care. For instance, if a patient has a tumor removed, they can choose to have their personal health budget used for the treatment of chronic pain. This type of budget can be used to provide many types of therapy, such as massage and hydrotherapy. Another patient may want to give their budget to their daughter to look after their last few months at home. As the demand for homecare continues to rise, some solutions will become standard offerings. One of these is the health kiosk, which is expected to be used in offices, airports, and hospitals to provide convenient and personalized care. In addition to providing a variety of medical services, such as blood pressure and glucose monitoring, the health kiosk can also perform other basic functions, such as accessing a patient's medical history. If a patient requires a hospital visit, the health kiosk can assist them in getting there by suggesting a manual check-up. It can also monitor their health and provide helpful advice on improving their fitness. It can additionally be placed in university campuses and hospitals to help students and young individuals avoid getting interrogated by a doctor. An interesting product for the future office or home is an automated external defibrillator, which can treat cardiac arrest. The device, which costs around \$150, can be used to diagnose and treat patients. An interesting product that's expected to be used in the future is an automated external defibrillator, which can be used to treat and diagnose cardiac arrest. The device, which costs around \$1500, can be used to save a life. Finally, in the future we're expected to see a shift in the way healthcare is delivered. This will involve the establishment of primary care settings that are

responsible for coordinating our overall care. This will allow patients to avoid going to the hospital for minor ailments and improve their quality of life. Routine procedures will also be conducted at different locations across the country. Developing countries such as China and Indonesia are investing a lot of money in the establishment of primary care facilities. The UK is also restructuring its healthcare system ( Singh, S. 2012).

## CHAPTER 5. Conclusion

### *MEGATRENDS*

The rapid pace of change that a company goes through can affect its ability to adapt. In order to keep up with the changes, it's important that the company makes significant investments in its resources. This strategy is similar to the one used by the Red Queen in "Through the Looking Glass." The importance of this strategy can help keep your employees focused on the tasks at hand. According to the Drive Framework, the five megatrends that are expected to have a significant impact on the global economy are predictable. However, they are also correctable if they threaten the sustainability of the planet and society. Despite these differences, the economies of other countries are still affected by these same trends. The Drive Framework can also help organizations and individuals understand the changes that are expected to happen in the future. Augmented reality is a type of technology that can be used to enhance the interaction between people. It can allow users to visualize their surroundings and their interests. It can also help them identify their new friends in the area. Through AR, users can see their surroundings and provide relevant information while they're walking around a certain area. For instance, while you're in a shopping mall, you can see the sales notifications for your favorite products by using this technology. People can also receive a social alert if they're near a potential business contact at the Starbucks next door or above a certain floor. Augmented reality can help people connect with their families and friends more easily. Also the digitization trend is expected to have a positive impact on the future. This process involves converting old digital information into a digital form, which can be stored and accessed through various electronic devices. According to

Fors and Stolterman, the creation of digital products and services has led to the improvement of the quality of life. Digitalization has allowed organizations to improve their efficiency by allowing them to consolidate their many business functions, which Bloomberg claims can help them implement new processes within their value chain. The process has also led to the development of new products and services. The rise of technological advancements has created a new generation of individuals who are more confident and open to new ideas. They are also more likely develop emotional intelligence. In the future, the increasing number of people who need non-clinical homecare will lead to a shortage of experienced and trained staff members. This issue can be addressed by governments. The rise of online and in-home health care services will continue to drive the evolution of the home health care industry. Some of these include disease management and vital sign monitoring. In Scandinavia, the concept of remote monitoring has been widely used. Through this method, patients can receive their test results from their doctor. Some nations, such as the UK, also provide personal health budgets that are designed to meet the needs of their individual patients. This method can be beneficial for people who live in countries that provide for their own healthcare. For instance, patients who have a tumor removed can use their personal health budget to treat chronic pain. It can also be used to provide various therapy methods, such as massage and hydrotherapy. Another patient may want to provide their daughter with their budget so that she can look after them at home.

### *INNOVATION*

The process of innovation involves numerous feedback loops and interactions. As the project goes through various steps, the costs of the project increase. This can increase the potential value of the innovation and the cost of the project. Even if the budget is reasonable, the prototype's next step can be more expensive than the first. The next step involves further

development and testing. The costs associated with these activities should be viewed as an indication of the potential value of the project. The rising costs will also increase the value of the project as it continues to progress. Even if a new product is always possible, it is not always feasible to predict its success. According to studies, many new products fail even though they are technically good. The most important factor that determines a product's commercial success is the market. This is done by taking into account the time and stage of development that the product has been in. The lower the uncertainty level, the more likely it is to succeed. The more uncertainty that exists regarding a project's potential success, the more likely it will fail. This means that the value of an innovation project will never be guaranteed until it has been attained. This means that if the product gets rejected, its value will plummet to zero or increase exponentially. The importance of innovation has led to the development of various barriers that prevent companies from being able to innovate. According to the literature, these include the lack of training systems, resources, and legislation. Besides these, other factors such as the lack of infrastructure and the misuse of talent are also contributing to the increasing number of barriers that prevent companies from developing new ideas. Some of these include the lack of motivation and vision, as well as rigid organizational structures and procedures. The lack of vision and the resistance to change are some of the factors that contribute to the development of barriers that prevent businesses from launching new ideas. A study conducted by the authors of this report identified various regional barriers that prevent innovation. Other factors such as the lack of support for markets and qualified personnel are also contributing to the development of barriers that prevent companies from being able to innovate. The literature also suggests that various factors can be considered when assessing the potential of a region to promote innovation. These

include its skilled labor force, technological infrastructure, and support from the public. Despite the multiple factors that can be considered, the process of innovation still remains very complex.

### *CHARACTERISTICS*

Block chain is a powerful technology that enables organizations to transform their business processes. Its ability to provide transparency and integrity allows them to make informed decisions. However, due to the rapid emergence and emergence of new technologies, such the Internet of Things and service-oriented architecture, it is becoming more challenging to manage their business process management tools. Despite the advantages of block chain technology, it is still prone to trade-offs between its openness, security, and cost. To survive in a competitive environment, businesses need to adopt flexible business processes that can help them collaborate and make collective decisions. Some of the factors that have caused businesses to rethink their approach to block chain include the rise of the Internet of Things and the increasing number of connected devices. When it comes to choosing a new technology, businesses should consider the availability of block chain. This type of technology can help them address distribution, security, and cost-effectiveness issues. Also understanding the properties of power in a supply chain can help inform our decisions regarding the value and revenue that we can receive from our products and services. A more rigorous approach to this is to adopt analytical classification. Through this process, we can make informed decisions regarding how to improve the efficiency and flow of value and revenue in our operations. According to many theories, the power of a supply chain is determined by the multiple physical resources that are involved in its construction. This concept is based on the competition among the multiple parties that control the supply chain. The power of a supply chain can also be influenced by the various vertical power struggles that occur within it. This concept helps us understand the various

operational conditions of the companies that are involved in the chain. Finally the rise of the Internet of Things is a paradigm shift in how businesses operate. It is expected to transform many aspects of their operations and strategies. Even in low-tech industries, the IoT is a threat. Even if the use of wireless sensors in farming was to be considered, it would be surprising that this technology was used in a low-tech industry. The IoT can still provide numerous opportunities for entrepreneurs. According to estimates, by 2025, there will be more than 50 billion connected devices.

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