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Yüksek Lisans Tezi

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Danışman: Prof. Dr. E. SERRA YURTKORU

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In memory of my grandfather who passed away. May God, have him in his holy mercy. To my dear parents, whose dedication cannot express my sincere feelings, for their endless patience, constant encouragement, and help, as a testimony of my deep love and respect for their great sacrifices, may God protect you and give you a long life full of health and happiness.

To my dear sister, brother, and nieces for their great love and support, they find here the expression of my highest gratitude. To my dear friends who, without their encouragement, this work would never have seen the light of day.

**UÇTAN UCA TEDARİK ZİNCİRİ KKP PLATFORMLARININ BENİMSENME SÜRECİNİN DEĞERLENDİRİLMESİ: MELEZ TKM/TOÇ MODELİNİN KULLANILDIĞI TEKSTİL PERAKENDE SEKTÖRÜ ÖRNEĞİ**


## ÖZET

Teknolojik yeniliklerin ve dijitalleşmenin yeni küresel trendi, tedarik zinciri dahil tüm sektörleri etkiledi. Dijitalleşmenin artması nedeniyle geleneksel tedarik zinciri, dijital bir tedarik zincirine dönüştü. Tüketici talebine hızlı bir şekilde yanıt vermeye olanak sağlayan Uçtan Uca Kurumsal Kaynak Planlama (Uçtan Uca KKP) Tedarik Zinciri Platformları da, tedarik zinciri inovasyon araçları arasında yerini aldı. Ancak tedarik zinciri dünyası bu KKP'yi benimsemekte çeşitli zorluklarla karşılaştı.

Bu çalışma, tekstil perakende endüstrisinde Uçtan Uca KKP tedarik zinciri platformlarının benimsenmesini incelemektedir. Bu platformların benimsenmesini etkileyen faktörleri incelemek için Teknoloji Kabul Modeli (TKM) ve Teknoloji-Organizasyon-Çevre modeli (TOÇ)'nin birleştirildiği bir hibrit model olarak kullanılmıştır. Modelde TKM'nin algılanan yararlılık ve kolay kullanım kavramları aracı değişkenler olarak kullanılırken, TOÇ kavramları dışsal değişkenler olarak kullanılmıştır. Hipotezleri test etmek için, tekstil perakende tedarik zinciri paydaşlarına bir anket uygulanmıştır. Hipotezler SMART-PLS aracılığıyla kısmi en küçük kareler yapısal eşitlik modellemesiyle (PLS-YEM) ile test edilmiş ve sonuçlar tüm bulunan ilişkilerin teknik beceri ve eğitimin benimseme niyeti ve algılanan kolay kullanım üzerindeki doğrudan veya dolaylı etkisi dışında anlamlı olduğunu göstermiştir.



## ANAHTAR KELİMELER

Dijital Dönüşümün benimsenmesi, Geleceğin Tedarik Zinciri, Uçtan uca platformlar, Teknoloji kabul modeli TKM, Teknoloji-Organizasyon-Çevre Modeli TOÇ.

**EVALUATION OF END-TO-END SUPPLY CHAIN ERP PLATFORMS ADOPTION: TEXTILE RETAIL INDUSTRY EXAMPLE USING A HYBRID TAM/TOE MODEL**


## ABSTRACT

The rise of technological innovation and digitalization has had a global impact on various sectors, including the supply chain. This trend has led to the transformation of traditional supply chain practices into a digital supply chain. End-to-End ERP Supply chain Platforms have emerged as a key tool for supply chain innovation and have enabled a quicker response to consumer demand. However, the adoption of these ERP Platforms has faced challenges in the supply chain industry.

This study examines the adoption of End-to-End ERP supply chain platforms in the textile retail industry, a hybrid model combining the Technology Acceptance Model (TAM) and the Technological-Organizational-Environmental model (TOE) was used to examine the factors influencing the adoption of these platforms. The constructs of the TAM perceived usefulness and perceived ease of use were used as mediating variables, while the TOE constructs were used as external variables. To test the hypotheses, a questionnaire was administered to textile retail supply chain stakeholders. The hypotheses were tested using partial least squares structural equation modeling (SEM-PLS) via SMART-PLS and the results showed that all the relationships found were significant except for the direct or indirect effect of technical skills, and training on adoption intention and relative advantage on perceived ease of use.



## KEYWORDS

Digital Transformation adoption, Future Supply Chain, End-to-end ERP, Technology Acceptance Model TAM, Technology-Organization-Environment Framework TOE.

**ÉVALUATION DE L'ADOPTION DES PLATEFORMES ERP DE LA CHAÎNE D'APPROVISIONNEMENT DE BOUT EN BOUT : EXEMPLE DE LA VENTE AU DÉTAIL TEXTILE À L'AIDE D'UN MODÈLE HYBRIDE TAM/TOE.**


## RÉSUMÉ

L'essor de l'innovation technologique et de la numérisation a eu un impact mondial sur divers secteurs, y compris la chaîne d'approvisionnement. Cette tendance a entraîné la transformation des pratiques traditionnelles de la chaîne d'approvisionnement en une chaîne d'approvisionnement numérique. Les plateformes de chaîne d'approvisionnement ERP de bout en bout ont émergé en tant qu'outil clé pour l'innovation de la chaîne d'approvisionnement et ont permis une réponse plus rapide à la demande des consommateurs. Cependant, l'adoption de ces plateformes ERP a rencontré des défis dans l'industrie de la chaîne d'approvisionnement.

Cette étude examine l'adoption de plateformes de chaîne d'approvisionnement ERP de bout en bout dans l'industrie du textile de détail. Un modèle hybride combinant le modèle d'acceptation de la technologie (TAM) et le modèle technologique-organisationnel-environnemental (TOE) a été utilisé pour examiner les facteurs influençant l'adoption de ces plateformes. Les constructions de l'utilité perçue et de la facilité d'utilisation perçue du TAM ont été utilisées en tant que variables médiatrices, tandis que les constructions du TOE ont été utilisées en tant que variables externes. Pour tester les hypothèses, un questionnaire a été administré aux parties prenantes de la chaîne d'approvisionnement du textile de détail. Les hypothèses ont été testées à l'aide de la modélisation des équations structurelles des moindres carrés partiels (SEM-PLS) via SMART-PLS et les résultats ont montré que toutes les relations trouvées étaient significatives, à l'exception de l'effet direct ou indirect des compétences techniques et de la formation sur l'intention d'adoption et l'avantage relatif sur la facilité d'utilisation perçue.



## KEYWORDS

Adoption de la transformation digitale, chaîne d'approvisionnement du future, plateformes de bout en bout, modèle d'acceptation de la technologie TAM, Framework technologie-organisation-environnement TOE.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| **ADI** | Adoption Intention |
| **AI** | Artificial Intelligence |
| **ANOVA** | Analysis of Variance |
| **AVE** | Average Variance Extracted |
| **CA** | Competitive Advantage |
| **CP** | Compatibility |
| **CR** | Composite Reliability |
| **CRM** | Customer Relationship Management |
| **CS** | Cost |
| **CX** | Complexity |
| **DSC** | Digital Supply Chain |
| **E2E** | End-To-End |
| **ERP** | Enterprise Resource Planning |
| **ICS** | Inventory Control System |
| **ICT** | Information and communication technologies |
| **IOT** | Internet of Things |
| **ISCM** | Internal Relationship Management |
| **IT** | Information Technology |
| **MRP** | Materials Requirements Planning |
| **OR** | Organizational Readiness |
| **PEOU** | Perceived Ease of Use |
| **PLS-PM** | Partial Least Square – Path Modelling |
| **PS** | Partner Support |
| **PU** | Perceived Usefulness |
| **PwC** | PricewaterhouseCoopers |
| **RA** | Relative Advantage |
| **SAP** | System Analysis Program Software Company |
| **SCM** | Supply Chain Management |
| **SEM** | Structural Equation Model |
| **SPSS** | Statistical Package for the Social Sciences |
| **SRM** | Supplier Relationship Management |
| **SRMR** | Standardized Root Mean Square Residual |
| **TAM** | Technology Acceptance Model |
| **TOE** | Technology Organizational Environment |
| **TRA** | Theory of reasoned Action |
| **TST** | Technical Skills / Training |

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# INTRODUCTION

In the last decade, with the increase of global trade and online business - more than 4 trillion U.S. dollars turnover achieved globally in e-commerce sales within 2020 (Coppola, 2021) - a new global trend of technological innovations and digitalization has affected all sectors including supply chain management. Supply chain management (SCM) is the full value chain of supply and material management of a specific product, starting from its raw material till it reaches the end consumer (Büyüközkan & Göçer, 2018).

Many companies still have a conventional supply chain, defined by Chiu (2019) as the non-appropriate use and access to the information at the right moment; consequently, massive organizational management inefficiencies occur, such as unreachable data records and vast amounts of unstructured data. Traditional supply chain management cannot be adaptive to innovative business environments while being accurate and cost optimizable.

In supply chains, stakeholders such as suppliers, partners, firms, shippers and dealers use, develop, and share data. These connections result in a plethora of challenges and opportunities in the whole value chain. This chain coordination is enhanced if all its stages execute action that are coordinated and raise the total supply chain surplus; this requires information sharing and consideration of the effects of one-stage activities on subsequent stages. A lack of information could occur due to competing local objectives at various supply chain stages or skewed and delayed information flow across stages (Chopra & Meindl, 2016).

Traditional supply chains, according to Capgemini Consulting (2011) rely on a combination of electronic procedures and paper-based records, organizational architectures are frequently exemplified by functional and geographical boundaries that are unable to communicate information accurately, resulting in sub-optimal effectiveness.

With the appearance of digital transformation, the conventional supply chain has been transformed by implementing Industry 4.0 principles to survive in rapidly changing markets and avoid traditional supply chain inconvenience (Ghadge et al, 2020). Hence, companies invest huge budgets and efforts in research and development to keep their organization and supply chain management innovative and digitalized. The majority of the world's successful firms which have excellent supply chains consider that competition among businesses is competition among supply

chains and digitalization is the need of the day. According to PwC, worldwide investments in the digitization of sectors would amount to $900 billion each year starting in 2020 (Sheshadri et al, 2021).

The evolution of global trade and business in the last decade has created a tough rivalry due to their penetration of global boundaries, where organizations have to discover developing digital technologies that may be leveraged to establish a new business strategy to survive and retain a sustainable competitive edge in this global market. The way global trade operations and processes are carried out in today's increasingly competitive world has led companies to implement modern technologies in the digital supply chain management such as end-to-end platforms. Every company's objective in this competitive and dynamic industry is to satisfy the customer while providing the right product at the right time with the quantity desired at an affordable price. In order to achieve this objective, these platforms need to provide the correct information which is regarded as a critical component of the supply chain because it serves as the glue that allows the other supply chain components to work together to create a unified, synchronized value chain.

A lack of information will keep the management from knowing what consumers require, how much inventory they have on hand, or when to manufacturer and ship additional merchandise. In other terms, information provides an end-to-end supply chain visibility enabling them to take right decisions and raise the chain's performance (Chopra and Meindl. 2016).

The Digital Supply Chain (DSC) can make better extensive information accessible, exceptional collaboration, and communications using digital platforms, which will result in a higher level of consistency, agility, and efficiency (Pyun & Rha, 2021).

Among the DSC tools that help to achieve the cited objectives are the end-to-end platforms, which consist of digitizing key supply chain operations, such as product design, material expenses, sampling, manufacturing, and shipping to the final creation and delivery of products. As an example, LI & FUNG group's platform try to make customers' processes more cohesive, productive, and cost-effective, allowing them to deliver data-driven insights.

LI & FUNG a multinational supply chain company intends to digitalize each operation in the retail supply chain industry through an online platform named "LF Digital Platform", where

its main goal is to combine the customers and suppliers as well as all the entities participating in the supply chain into a unified platform that enables all the stakeholders to enhance SCM efficiency from design ideas to digital sampling, online costing, tracking process, manufacturing and buying forecasts, inventory management (Pearsall et al, 2011).

Despite the benefits of DSC generally and end-to-end platforms specifically, several sectors are facing challenges to get these tools integrated and being adopted into organizations, in terms of the lack of frameworks and guides for supply chain digitalization adoption. In our study, we will clarify the customer adoption intention of the end-to-end platform in the textile retail industry, by applying the integrated model TOE-TAM. We will determine what are the factors influencing customer acceptance and adoption of these platforms.

# 1. Literature Review

## 1.1. The Fourth Industrial Revolution

The manufacturing and industrial services both had substantial effects from previous industrial revolutions. The industrial revolutions' rapid changes in the service and manufacturing systems increased business efficiency (Salkin et al, 2018).

Industrialization was the primary engine of the worldwide historical transformations that began in the nineteenth and twentieth centuries and continue to impact the twenty-first century and our world. Historically, three outbreaks of industrial revolutions have occurred; the first began in Western Europe and USA the in the 17$^{th}$ century and it continued to spread with its developments in Great Britain. While the second started in the 1880s and spread mainly in parts of Eastern Europe and Russia. The most current wave before the explosion of the fourth revolution started in the Pacific countries in the 1960s and spread to India, and parts of Latin America two decades later. Almost every major phase of industrial development swiftly swallowed other nations that weren't fully developed, changing their fundamental social and economic linkages (Stearns 2012).

The first three industrial revolutions spanned for approximately two centuries. The shift from fabric manufacturing in private homes to centralized factories, which began in the 17th century with the introduction of steam-powered mechanical looms and other mechanical production equipment, resulted in a significant increase in productivity. Approximately a century later, the implementation of conveyor belts in slaughterhouses in Ohio marked the beginning of the Second Industrial Age. Later in the following years, the manufacturing of the Ford in the US had ed the apex of this era where a significant increase in the efficacy and productivity had been realized thanks to conveyor belts and continuous production lines. As reported by Drath and Horch (2014) the third industrial revolution began in 1969 with the advent of the first programmable logic controller, which enabled the digital programming of industrial systems, leading to the development of highly flexible and successful automation systems. This programming paradigm still governs the engineering of modern automation systems.

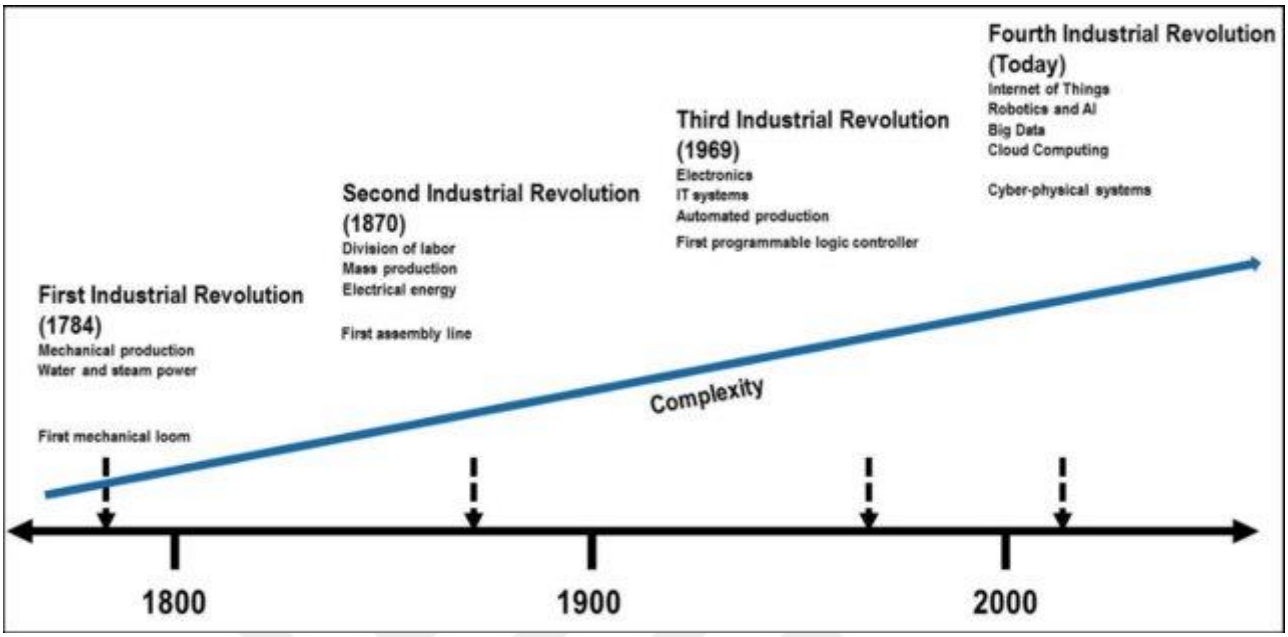


**Figure 1:** An Overview of industry Waves throughout History

Source : Demir, K. A., & Cicibas, H. (2017). Industry 5.0 and a Critique of Industry 4.0. In Proceedings of the 4th international management information systems conference, Istanbul, Turkey (pp. 17-20).

Industry 4.0 refers to the integration of physical operations with information and communication technology in industrial production. Information and communication technologies (ICT) are being successfully integrated into manufacturing, which is meant by industry 4.0. The top three German organizations in the mechanical engineering, ICT, and electrical industries—VDMA, Bitkom, and ZVEI—announced a definition of Industry 4.0 in the spring of 2014. According to these companies, the purpose of industry 4.0 is to optimize the value chain through the adoption of intelligent tools that allow automated control of supply chain (Kolberg & Zühlke 2015)

This last industrial revolution program is expected to radically alter how products and production systems are designed, manufactured, operated, and serviced. The connectivity and interaction between objects, machines, and people will speed up production systems' processes by up to 30%, and nearly to 25% boos effectiveness (Rüßmann et al, 2015).

It is a revolutionary development supported by a number of technological pillars, including IOT, cloud computing, and big data analysis. Data analysis enables systems to foresee weakness, configure autonomously, and respond to market changes. With the help of Industry 4.0, data can

be collected and analyzed across machines, creating a quick, adaptable, and productive structure that produces high quality goods at a cheaper price. Hence, as the rate of industrial development increases, Industry 4.0 increases value chain productivity and this productivity growth provides a firm with a competitive advantage over its competitors (Rüßmann et al, 2015).

Supply chains and logistics operations found a significant increase and quick developments during the 1990s and early 2000s. The freight transportation sector was faced with tough challenges as a result of these changes. Two of the major issues facing the sector were the need of client satisfaction and just-in-time operations.

The purchase and distribution of goods have been impacted by this quick tendency as economies and markets have become more worldwide. To address these issues in the supply chain sector, new revolutionary technologies have been created such as the Global Positioning System which is a satellite-based navigational technology (Cummins et al, 2013). The adoption of these new techthis new technologyin companies significantly boosted their operational capacity and ability to make decisions in real-time (Roy 2001).

## 1.2. Supply Chain Management

As stated by Chopra and Meindl (2016) supply chain management encompasses all entities involved in fulfilling a customer's demand, including manufacturers, suppliers, transporters, warehouses, retailers, and customers. This encompasses all the activities necessary to receive and fulfill a client request, including product development, marketing, operations, distribution, financing, and customer service, across all types of companies, including those in manufacturing.

Growing the overall supply chain surplus, which is defined as the difference between the value created for the customer and the total cost spent along the entire supply chain, should be the aim of a supply chain.

When the emphasis is on increasing the overall value of the supply chain, it benefits all the parties involved. Supply chain decisions have a significant impact on both revenue and costs; therefore, they play a crucial role in determining the success or failure of a company.

Successful supply chains control product, information, and money movements to maintain low costs while offering customers a high degree of product availability.

## 1.3. Supply Chain IT Framework

The supply chain management concept has expanded the decision area when it comes to managing businesses, this expansion is due to the optimization attempts across departments, inter-enterprise the entire supply chain. When making decisions, it's essential to consider all the processes involved in the value chain. Main decision areas in the supply chain can be classified into the following processes

1. **Supplier Relationship Management** which represents the value chain input,
2. **Internally Supply chain management** which represents the core value chain management and
3. **Customer relationship management** which represents the output of the value chain (Chopra and Meindl, 2016).

Enterprise resource planning (ERP) serves as the foundation for all the operations and analytics associated with these processes. (See Figure 2).

| Supplier Relationship Management (SRM) | Internal Supply Chain Management (ISCM) | Customer Relationship Management (CRM) |
|---|---|---|
| End-to-End Supply Chain ERP Platforms | | |

**Figure 2:** Supply Chain Processes Framework

Source: Mazmum, M. F. A. (2015). The Role of Information Technology (IT) in Supply Chain Macro Processes: A Literature Based Study. Bangladesh *Journal of MIS, 7*(1). p18

Businesses should focus on the broader processes mentioned above, as the performance of an organization becomes increasingly linked to the performance of its supply chain.

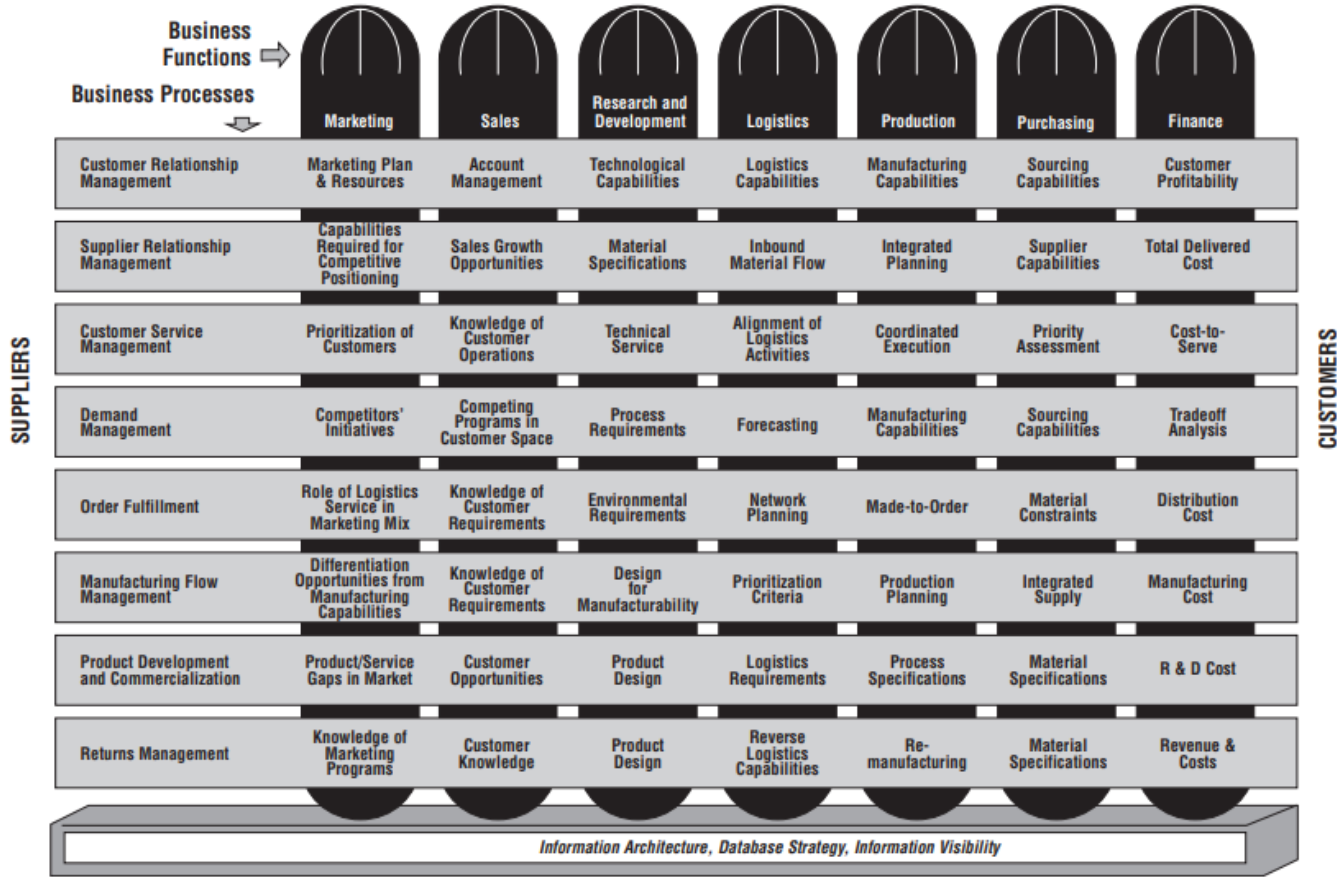


**Figure 3:** Functional contribution in the supply chain system.

Source: Lambert, Douglas M., Supply Chain Management: Processes, Partnerships, Performance, Sarasota, Florida: Supply Chain Management Institute, 2008, p. 15.

As previously noted, a successful supply chain management approach does not involve one aspect of the supply chain reaping benefits at the expense of others. In order to achieve revolutionary performance, successful supply chain management aims to increase the value chain surplus (Chopra & Meindl, 2016) which necessitates that each business looks for the optimization at the entire supply chain in terms of the three macro processes defined as customer relationship management, internal supply chain management and supplier relationship management.

### 1.3.1. Customer Relationship Management

The CRM macro process, which encompasses the interactions between a company and its customers as a result of the supply chain, includes two primary objectives: generating customer demand and tracking and transmitting orders. The sales team, marketing department, and call

center constitute the CRM (Shaikh et al, 2014). Among the processes executed under CRM are marketing, where decisions are made in order to know which customers to target, what items to sell and how to price them using effective IT CRM systems that provide reliable analytics regarding customer profitability analytics. Other processes are executed under CRM such as selling where in this process orders are managed. The call center is considered a CRM process as well where it assists customers to place orders, provide suggestions, solving issues and providing updates regarding order status. Marketing and fulfillment, customer service and support, loyalty and engagement programs, contact and account management, and sales are the main application clusters in CRM (O'Brien & Marakas, 2011).

### 1.3.2. Internal Supply Chain Management

ISCM is focused on a company internal operation, it includes all the steps involved in fulfilment and customer order such as strategic planning where the supply chain's network architecture is the process' main focus (Shaikh et al, 2014). Demand management is predicting demand and other processes, for instance, supply planning and fulfilment where it is planned how to satisfy the demand after that the plan is executed, fulfilled and delivered. Finally, the product needs to be serviced after its delivery, this defers depending on the sector exercised (Chopra et al, 2009). Manufacturing & Production, Sales & Marketing, Finance & Accounting, and Human Resources are the main fundamental areas that typically make up an ISCM macro process, along with their respective sub processes (Laudon & Laudon, 2013). Production, distribution, and sales operations within a business make up the internal supply chain. It simulates production management, outbound, and inbound activities (Shaikh et al, 2014). To improve supply chain surplus, all of these operations necessitate integration and information sharing among these processes (Chopra et al, 2009).

### 1.3.3. Supplier Relationship Management

Processes targeted at interactions between the company and suppliers as the input in the supply chain are included in SRM. Given that incorporating supplier restrictions is essential for developing internal plans where if forms a connection between supplier relationship processes and the internal supply chain management processes. According to Shaikh et al. (2014) SRM is a collection of procedures for directing, planning, and facilitating the interaction, communication, and cooperation between a business and its suppliers. SRM macro processes include sourcing,

negotiation, design collaboration, and supply collaboration. These processes and activities all center on the interaction between the company and suppliers. It is claimed that the goal of SRM is to form partnerships with important suppliers in order to realize the cost optimization, develop with new products, and generate value for both sides based on a shared commitment to long-term cooperation and success (Doughlas, 2008). It is affirmed that SRM increases and enhances the communication of shared information between an organization and its vendors in the goal of in increase the supply chain surplus (Van Zyl, 2005).

The management of these broader processes is the foundation of the supply chain. It is essential for there to be a strong integration between the ISCM and CRM macro processes, as the ISCM macro process aims to meet the demand generated by CRM operations. CRM engagement is vital for demand forecasting as these applications interact directly with the customer, and therefore have access to the most data and insights into customer behavior. It is essential to note that ISCM processes should be closely aligned with SRM processes. Supply chain management operations, including supply planning, fulfillment, and field service, are dependent on suppliers. Without the necessary components provided by suppliers, it is of little value for a factory to possess the capability to meet demand. The coordination between order management, which is a component of CRM, and fulfillment is crucial in order to achieve efficient demand forecasting. Therefore, the integration of the macro processes is vital to achieve optimal supply chain performance (Chopra & Meindl, 2016).

### 1.3.4. The importance of IT in Supply Chain Processes

Information technology (IT) is defined by Jeffrey and Lonnie (2007) and Laudon and Laudon (2013) as all the computer technology (hardware and software) as well as the telecommunication technology (data, image, networks) that a company uses to accomplish its business goals. IT from the supply chain perspective is defined by Chopra et al. (2009) as made up of people, software, and hardware. It aids in information gathering, investigation, and reaction, which enhances supply chain performance. It is acknowledged by James and George (2011) that information systems and technology are a crucial component of company success in the fast-paced, worldwide environment of today. Every type of organization can benefit from information technologies to enhance the accuracy and profitability of their managerial decision-making, workforce cooperation, and operational processes. As a result, their competitive advantages in

markets that are changing quickly are getting stronger. IT plays an important role in the supply chain management as it represents the pillars of SCM processes. The appropriate usage of IT tools in the SCM, mainly in the modernizing of the whole distribution network in order to achieve improved service quality and maximize the supply chain surplus (Nair & Raju, 2010). The integration of inter-organizational systems with the information technology architecture will facilitate the flow of information along the chain and guarantee the efficient movement of products (Preem, 2000). IT has two key goals in SCM: assuring information availability and facilitating the coordination between the management and its customers and suppliers (Muriel & Simchi-Levi, 2003).

Several companies in the new century, have strengthened their business performance after using implementing the IT infrastructure, for instance; Cisco developed web-based solutions to link the operations with suppliers and customers and saved over $500 million, Walmart succeeded to relate its retail sales points data directly with its major suppliers within the industry using IT (Berger, 2000). It is obvious that IT plays two crucial functions in SCM: coordination and information exchange. This is done by integrating the chain's partners. The integration maintains coordination across critical operations, giving managers the chance to comprehend what is happening in their company and how to react for future decisions, and provides supply chain partners with real-time information.

The role of information technology has been showed in the Figure 4 as the pillar of the SCM, including ERP platforms:

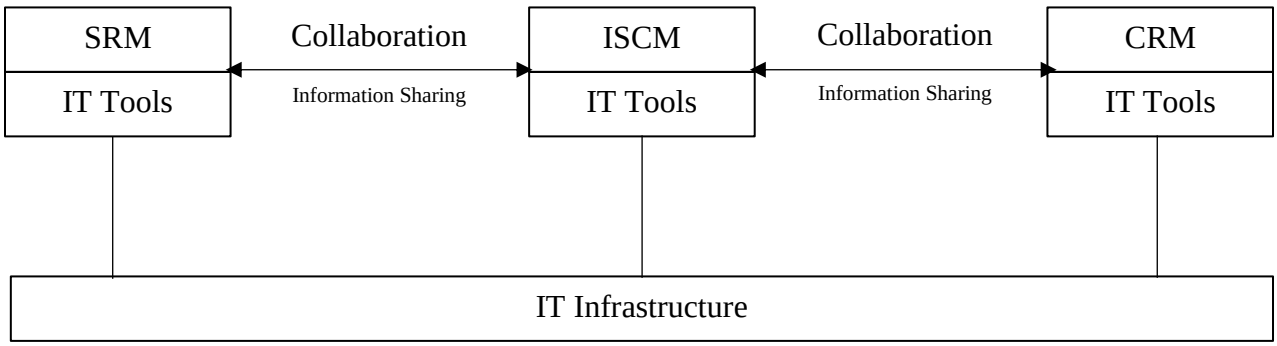


**Figure 4:** The role of IT in Supply Chain Processes

Source: Mazmum, M. F. A. (2015). The Role of Information Technology (IT) in Supply Chain Macro Processes: A Literature Based Study. Bangladesh Journal of MIS, 7(1). p18

## 1.4. The Industrial Supply Chain Digitalization

Businesses must always offer excellent enterprise solutions in a competitive market with adaptable and marketing-focused frameworks. To realize their company objectives, they need to set new business goals. IT specialists have equipped the business with systems, and in most situations, these systems are made up of individual functions that should be used simultaneously where Enterprise Resource Planning (ERP) software has emerged from Material Resource Planning (MRP) to offer an integrated solution (Chung & Synder 1999).

### 1.4.1. Inventory Control Systems (ICS)

Cost was a manufacturer's main competitive advantage in the early 1960s. As a result, throughout this time period, businesses mostly concentrated on large volume manufacturing and cost reduction. For many companies, inventory management systems (ICS) were satisfying their basic production and organization requirements. (Jacobs & Weston 2007).

### 1.4.2. Materials Requirements planning (MRP)

In order to satisfy the demand for a cutting-edge system able for planning and scheduling materials for the production of complex products, MRP was born in the late 1960s. The MRP solutions were expensive, sluggish, and difficult to manage because they needed a large technical support staff to operate the mainframe computers. Hence, the MRP was succeeded by first Manufacturing Resource Planning (MRP 2), and after that by the Enterprise Resource Planning (ERP). (Jacobs & Weston 2007).

Companies' main competitive advantage changed from cost to marketing in the late 1970s. The producers at the time used distinctive target-market methods by placing a focus on manufacturing planning. In other words, they focused on integrating production processes while identifying their niche market by focusing on a specific consumer group for their product or service. These MRP solutions allowed for the integration of key business processes like predictions, master manufacturing, purchasing, manufacturing, and inventory management, which satisfied the needs of businesses in the late 1970s. Many solutions were established in the middle of the 1970s in response to the demand for corporate technology solutions, including SAP, Oracle, which would go on to become the leading ERP organizations in the last decade (Jacobs & Weston 2007).

ERP implementations are system software for manufacturing that are based on a time-phased order release mechanism. These systems allocate activities, tasks, and resources over a pre-determined time frame in accordance with the attainment of a specific goal, mission, or project. As reported by Shehab et al, (2004) production and purchase orders are planned and distributed based on a pre-determined production schedule to ensure that products and equipment are obtained when needed on the manufacturing line (MPS). MRP systems offer several benefits, including decreased inventory, enhanced customer service, and increased efficiency and productivity.

### 1.4.3. Manufacturing Resource planning (MRP II)

Following the introduction of the now-famous Total Quality Management, "quality" became the major competitive advantage of businesses in the 1980s. Companies' manufacturing strategies in this decade have generally concentrated on stringent process control, high-quality production, and efforts to lower overhead costs.

Companies sought to have their products, services, and procedures rated among the best by consumers and industry professionals. Due to these changes in businesses' fundamental competitive advantage, the scope of current enterprise technology solutions needed to be revised (Jacobs & Weston 2007). Consequently, MRP has been developed in order to evolve more primary business functions including production, marketing and finance and other departments such as human resources, and purchasing into the planning process (Chen 2001). The manufacturing and materials management systems, as well as the financial accounting and financial management systems, were all integrated via MRP II systems. With the help of this system integration, businesses were able to expand on their activities and operations, transform all of their activities into financial statements, and make right decisions regarding the resources and capacity needed for planned operations (Umble et al, 2003).

### 1.4.4. Enterprise Resource Planning ERP

In the 1990’s, due to some crucial business sectors, including project management, human resources, finance, information warehousing, capacity planning, and product design, these sectors have an impact on the businesses looking to get a competitive edge by efficiently employing their resources. In gratitude to the ERP software providers unlike previous versions these vital business sectors could be implemented by producers and non-producer organizations (Ptak & Schragenheim 2003).

ERP systems are composed of many packages that assist a corporation's quotidian operation and decision-making process. ERP unifies and automates a variety of company processes, including supply chain management, Supplier relationship management, customer relationship management, inventory management, Production scheduling, sales assistance, human resources and finance and accounting (Hitt et al, 2002). These latter functionalities have made ERP able to plan a company's supplier merchandise moreover, its internal supply chain management taking into consideration the consumer demand, while previous version have been limited on the planning and scheduling of a company's internal resources (Chen, 2001) At the early start of ERP, many back-office activities have been added, covering order managing, asset management, quality control, warehousing, distribution production, financial management. Subsequently, the capabilities of these systems were expanded to include front-office tasks including, electronic e-commerce, and Sales force automation (Rao, 2000).

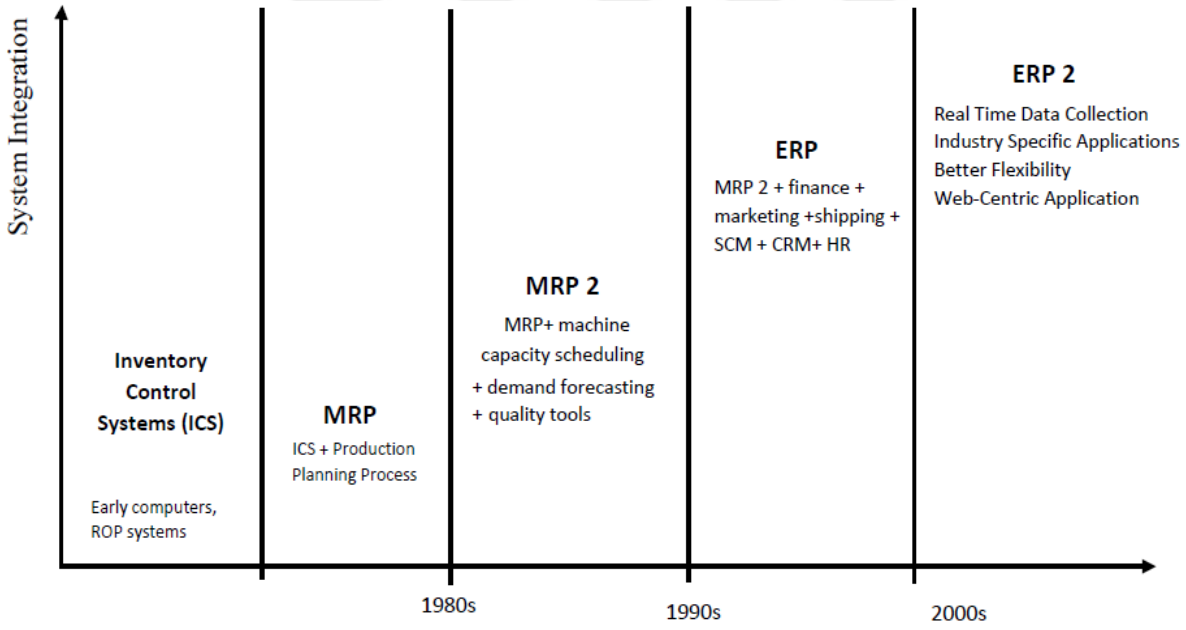


**Figure 5:** A Historical Overview of IT management solutions

Source: Demir, S., Paksoy, T., & Kochan, C. G. (2020). Logistics 4.0: SCM in Industry 4.0 Era: (Changing Patterns of Logistics in Industry 4.0 and Role of Digital Transformation in SCM). In Logistics 4.0 pp. 15-26.

## 1.5. Digital Supply Chain Management

Information is used, produced, and shared by suppliers, partners, businesses, and dealers throughout supply chains, as a result of these relationships, SCM is influenced by a wide variety of opportunities and challenges. The digital supply chain is defined by Büyüközkan & Göçer (2018) as a smart chain value-driven process that uses cutting-edge technology and analytical techniques to develop new sources of income and business value for enterprises. They affirmed as well that digital supply chain is not related to the nature of products and services being digital or not, it is the know-how of managing supply chain processes using a wide variety of innovative technologies such as Internet of Things (IoT) and End-To-End ERP platforms.

Nowadays, supply chains require a high number of complicated operations which need to be managed and monitored appropriately, thereby, Digital Supply Chain (DSC) allows to establish a developed value chain structure offering several features among them is **Speed** where all the stakeholders involved in the digital supply chain set a high priority on delivery times. One of a DSC's most crucial pillars will be the ability to respond swiftly to demand as businesses search for new strategies for expediting product delivery (Hanifan et al, 2014). **Flexibility** is another feature provided by DSC where supply chains that are digitally integrated must be flexible enough to respond quickly to changing circumstances and the way to react to unexpected problems (Schrauf & Bertram, 2016). **Global Connectivity** is a feature provided by DSC where organizations must have rapid global distribution of their products and services. Because of this, businesses need a global supply chain that not only allows for on-time delivery but also guarantees a rapid response in each region. For example, having a product manufactured in Europe shipped to the United States at the precise moment it is needed would be inefficient. It could cost a lot of time and money to do so. As a result, DSC creates a system whereby global access points may be built to effectively supply goods and services locally, rather than shipping them all the way around the world for a single request. (Hanifan et al, 2014). **Real Time Inventory** in DSC gives us the ability to keep just enough inventory on hand to meet demand without going into overstock. Utilizing sensor arrays or other data-driven cutting-edge technology, DSC improves warehouse management and provides constant stock-level monitoring. The demand and supply must always remain in synchronize, despite the ever-shifting nature of consumer preferences. While purchasers may make orders at any time and from any location, inventory levels must be managed in real time; however,

this does not imply that each fulfilment center must hold the same number of products. In reality, this implies that current and future demand for products and services must be predicted and analyzed in order to reach intelligent decisions (Schrauf & Bertram, 2016).

## 1.6. End-To-End Supply Chain Visibility

In the industry, due to the use of digital supply chain, global businesses have dramatically increased in the last decade, an intelligent interconnected global integration is considered as the success criteria of a global supply chain, organizations with DSC and highly digital operations can anticipate 4.1% yearly efficiency gains and 2.9% annual revenue growth (Schrauf & Bertram, 2016) however, these global businesses may not be managed accurately when it comes to complex operations and being sensitive to risks.

Through the End-to-End visibility process that applies to all supply chain macro-processes, organizations may reliably benefit and extract value from their ERP implementations.

The process of end-to-end visibility (E2E), is defined as visibility across supply chain management processes, from product conception and raw material sourcing to the point where finished goods are delivered to consumers, all while collecting data and insights.

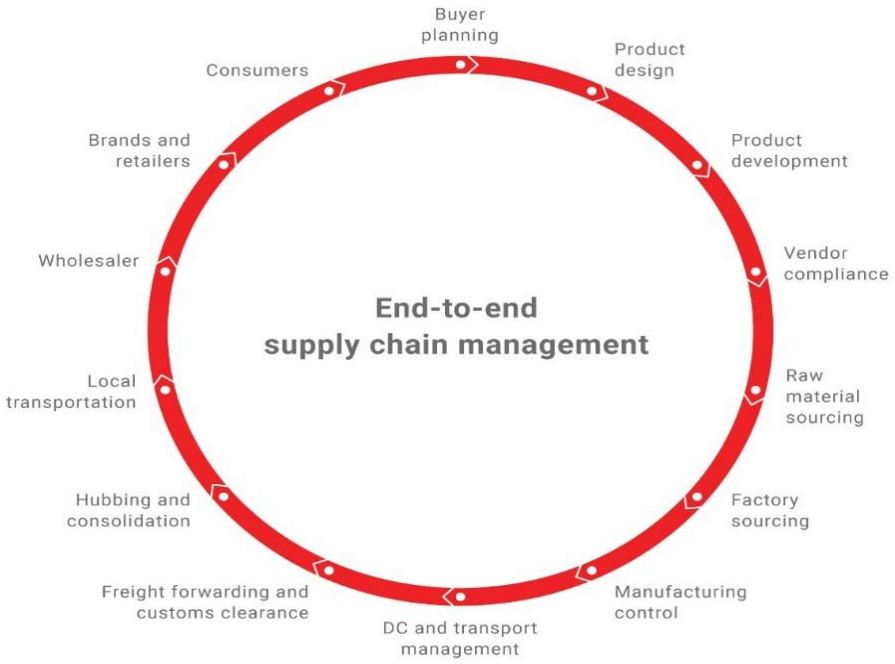


**Figure 6:** End-to-End Supply Chain Visibility Process

Source: LF Digital Platform – https://www.lifung.com/supply-chain-innovation/lf-digital-platform

This transparency can be reached by constantly controlling every stage of the chain, collecting the pertinent information, and placing it in a centralized information management area. From there, it can be examined, analyzed, and eventually extract for useful insight that will enhance business operations, and strategic decision-making (Pearsall et al, 2011).

Collaboration throughout the entire value chain is crucial in the goal to get a sustainable value chain. Throughout a product's entire life cycle, supply chain partners must collaborate across the end-to-end supply chain in order to oversee the information, people, processes, and decisions (Marshall et al, 2016).

Taking as an example Li & Fung group with its customized end-to-end supply chain ERP platform developed for global brands and retailers, which their idea consists of connecting thousands of suppliers and vendors with leading brands and retailers, all with the purpose of satisfying customer needs and having an optimizable supply chain.

### 1.6.1. Digital Supply Chain in Textile

The international textile supply chain is currently experiencing a considerable change into a technology-driven and value-added business operation with the advancements in digitalization and globalization (Revathi & Aithal, 2019). The digital transformation in the textile supply chain had a significant influence on a variety of aspects, including sourcing strategy, sampling process, supply chain visibility, partner cooperation, information sharing, and analysis (Pal & Jayarathne, 2022). End-to-End ERP platform vendors in the textile sector have proposed their solution assuming to handle several challenges in the sector such as ineffective sourcing procedures, extensive procurement lead times, limited access to industry information, insufficient supply chain visibility, and poor communication among all business stakeholders (Agrawal et al, 2021).

Among these End-to-End ERP platforms, Li & Fung Platform specialized in the textile field carry out all the operations in the supply chain starting with product design and including all aspects of compliance, factory sourcing, manufacturing control, and logistics. Li & Fung Platform allows following up the merchandize while its delivery and customs operations to the global brands and retailers, local transportation, distribution, inventory management, sales to final consumers with the goal of delivering data-driven insights and duplicate the product life cycle (Fung, 2017).

The primary objective of the digital platform is to integrate both customer and vendor portals into a single platform that enables both parties to enhance SCM operations, from collaborative designing to digital sampling, online costing and fitting reviews, all of which are powered by data analytics.

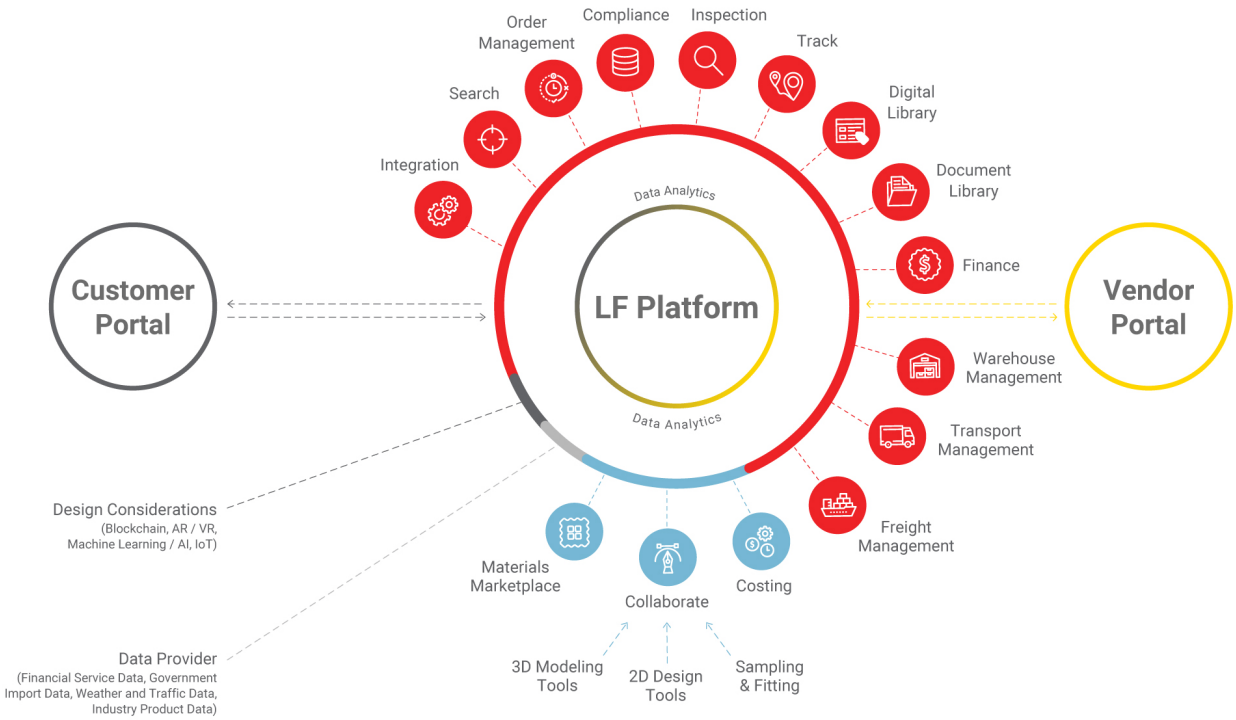


**Figure 7**: Li & Fung E2E SCM Platform

**Source:** LF Digital Platform – https://www.lifung.com/supply-chain-innovation/lf-digital-platform

Breaking the mold of a typical sourcing agent, this platform provides manufacturers, factories, and other suppliers with a variety of solutions to assist them handle supply chain complexity and greater compliance in order to speed the establishment of sustainable supply chain solutions. Among the advanced tools of this platform are: trend engine platform, where the insights are gained insights into best-selling items based on market data and adapt product strategy to increase sales. This draws inspiration from industry leading trends, offering firms the creative freedom to build items in time to follow the trend wave. Second tool is global collaboration presented as a virtual workplace where retail teams may interact remotely and use all of the

resources for creating end-to-end 3D products, including as materials catalogues, blocks, and patterns (Fung, 2017).

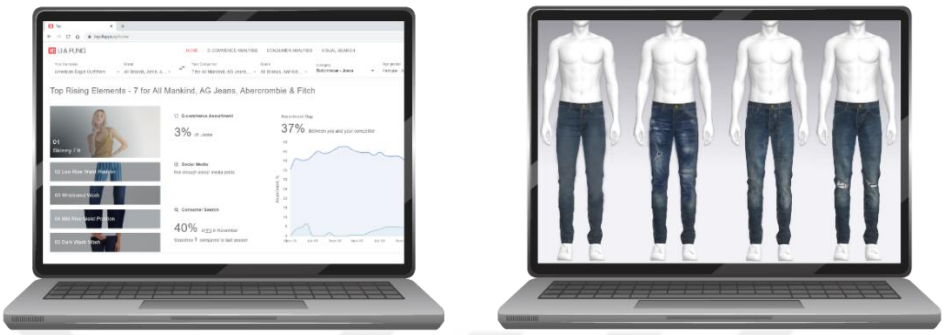

**Figure 8**: Li & Fung Digital Tools: Trading Engine / 3D Virtual Design

Source: LF Digital Platform – https://www.lifung.com/supply-chain-innovation/lf-digital-platform

Another tool which is Virtual 3D design where it allows stakeholders to move quickly from proof of concept to testing and final design. Not only is the time for sample and adoption reduced from weeks to hours, but the digital assets are reusable, allowing designs to move immediately to marketing or ecommerce sites and be utilized for pricing and future design. The incremental cost of product development iterations is near negligible, and waste from unneeded samples and transportation is reduced.

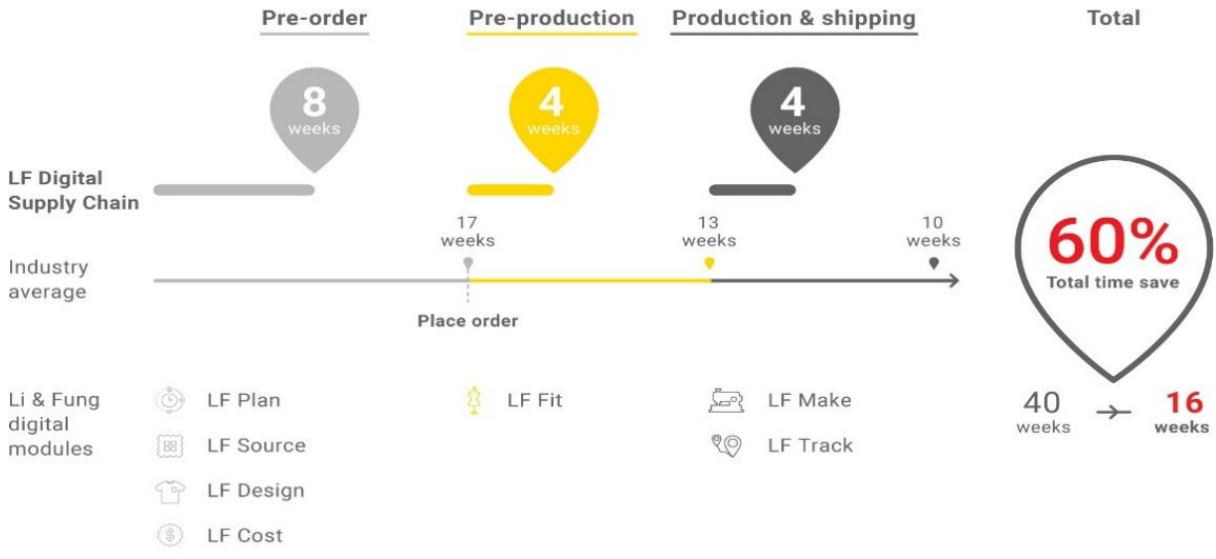


**Figure 9**: Product Cycle using Li & Fung E2E Platform

**Source**: LF Digital Platform – https://www.lifung.com/supply-chain-innovation/lf-digital-platform

Figure 9 illustrates how it is done to enable a faster product cycle, taking the industry average of 40 weeks and reducing it by 60% to 16 weeks.

Other dynamic costing tools are implemented in Li & Fung platform that enable profitably merchandising, linking design decisions with business outcomes. Scenario-based analysis, forecasting and pre-costing with real-time adjustments are instrumental in promoting agility, enabling faster decision-making, and aligning orders with the most appropriate manufacturer. The objective is to enhance speed, helping clients to minimize production lead times and augment speed-to-market. This includes making decisions closer to market timing, promptly reacting to trends, enhancing inventory management and reducing markdowns - all with the aim of maximizing profitability (Fung, 2017).

Another End-To-End supply chain platform developed by Oracle, Oracle SCM provides end-to-end insight across the whole supply chain, allowing organizations to bring goods to market more quickly while reducing costs and risk. Aligning supply chain operations with company objectives will enhance decision-making, assure compliance, and exceed consumer expectations. An end-to-end business process that encompasses the flow of a product's whole lifecycle, such as where it began, how the raw ingredients were transported and kept, and managing its inventory until it is consumed (Oracle website 2017).

End-To-End Supply Chain ERP platform is a type of digitalization in the industry 4.0 which can provide innovation, speed, cost advantage, scalability and access to data and updates across the entire value chain (Suherman & Simatupang 2017). However, PricewaterhouseCoopers (PwC, 2016) conducted a study in 2016 that highlighted the sluggish pace of digitization by stating, in part, "... on the rise of Industry 4.0, only a third of companies surveyed have already started to digitize their supply chains, while 72 percent of respondents were not expecting to do so in the next five years." These platforms may be subject to many challenges and difficulties which can be classified into three categories based on the literature.

First challenge is associated with technological factors, according to Guo, Chao and Chirag (2016), E2E SC ERP platforms are known for their issues related to data security and privacy. The above citation highlighted that most of organizations are worried where their data are physically

stored by their service providers and are they enough protected (Pearson, 2009). Related to the privacy and security issue, relevant data in an organization can be disclosed accidently through giving the wrong control access by managers across different departments and SC processes (Peng & Nunes, 2009). Moreover, these data are hosted by third party service provider where it leads to the possibility of access and download of customer data (Guo Chao & Chirag, 2016). Another technological challenge which is in case of non-satisfaction of customer needs and requirements by end-to-end service providers, customers may want to switch to different providers, this action may be costly and time consuming, furthermore, a new platform implies a new organization's culture reshape, distribution and operation. Consequently, due to these possible barriers and difficulties, companies may find themselves unable to shift vendors in the event of dissatisfaction with services, a situation referred to as the vendor lock-in scenario (Armbrust et al, 2010; Dutta et al, 2013; Rajan & Baral, 2015). Another challenge which is considered as a part of technological factor is complex integration and compatibility problems, these issues include the degree of compatibility with an organization's technological features of end-to-end service as well as customizing existing apps (Géczy and Co, 2012). The organization should be able to migrate their data without encountering compatibility problems, this new implementation presents a difficulty due to the complexity of its integration to the existing system since it necessitates a degree of expertise that might not be readily available in the organization (Hasan & Bassam, 2007).

The second challenge is associated to the organizational factors, it is considered that without top management support, an organization cannot successfully adopt a digital transformation of supply chain (Maduku et al, 2016). Another obstacle to the successful adoption of ERP platforms has been highlighted as a lack of cooperation and communication between relevant functional departments, moreover, in case of ineffective ERP implementation planning, subsequently, it will result in inadequate maintenance budgeting which will lead to the non-ability of system performing, upgrade and maintenance (Peng & Nunes, 2010). It is believed that the lack of internal skills and internal IT expertise is a significant obstacle to the implementation of new ERP systems, which necessitate data science expertise and domain knowledge of supply chain operations in order to fully leverage End-To-End platforms (Hoberg et al, 2015).

The third challenge is associated to the environmental factors, the non-adoption and not aligning with technology innovation will lead an organization in a competitive loss for instance

the loss of potential clientele (Wang et al., 2015). Another challenge related to the vendor of the technology if they are able to provide a training and technical help, and always guarantee the availability and the privacy of the data (Kinuthia & Njenga, 2014). In the next section, we will clarify what are the factors that could be affecting the adoption of End-to-End ERP platforms.

## 1.7. End-To-End ERP Platforms Adoption

There are numerous End-to-End ERP vendors selling their products. Thus, when it comes to their adoption, they will be appraised based on numerous criteria, the next section will detail the literature on technology adoption theory that this study will be based on.

Researchers have focused a lot of efforts in recent decades on studying how to get people to use big innovations. Rogers (2003) is one of these researchers; he is widely regarded as the creator of the notion of invention diffusion. Rogers (2003) defined in his book innovation as “an idea, practice, or project that is perceived as new by an individual or other unit of adoption”. When compared, diffusion is "the process by which an innovation is shared through specified channels over time among the members of a social organization" (Rogers, 2003, p. 5). Under this interpretation, technologies that have been invented for a while but are only now being adopted can be called innovative.

The adoption of innovations has a process of five different steps as shown in the Figure 10, (Rogers, 2003):

- Knowledge: At this point, the adopting group or individual learns about the current innovation, its potential applications, and, in some situations, the rationale behind the innovation's operation.
- Persuasion: Perspective on the new development grow as adopters learn to use the new technology.
- Decision: A conclusion is reached on whether or not to implement the invention.
- Implementation: This is when innovation comes into play.
- Confirmation: There will be another round of debate about the adoption issue. A choice is made about whether or not to keep using the innovation.

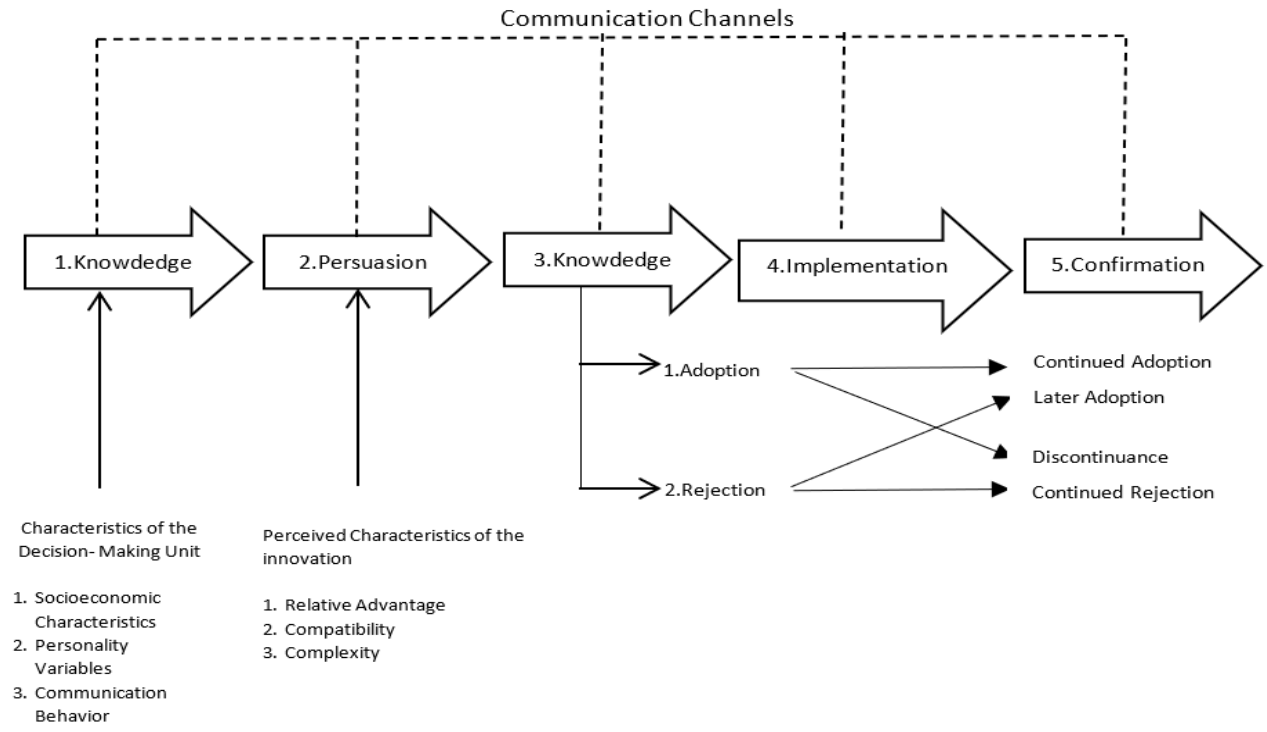


**Figure 10**: A Model of Five Stages in the Innovation-Decision Process

**Source**: Diffusion of Innovations, Fifth Edition by Everett M. Rogers, 2003.

The adoption in this study will be analyzed based on the use of a hybrid model Technological Acceptance Model TAM and Technological Organizational Environmental TOE Model which will be defined as follows:

### 1.7.1. Technology Acceptance Model (TAM):

The Technology Acceptance Model, as first proposed by Davis in his doctoral thesis of 1986, endeavors to forecast and illuminate the adoption of an information system through the examination of variables pertaining to perceptions, perceived usefulness and ease of use, as well as attitudes that engender behavioral intentions of usage (Davis, 1986).

This model is an adaption of the Theory of Reasoned Action (TRA), which was created specifically to model user acceptance of the information system. The objective of TAM is to gain a broad understanding of the factors that influence technology adoption. It is capable of describing user behavior across a variety of end-user operating systems and user communities worldwide while being both cautious and logically justified at the same time (Davis et al, 1989).

The TAM is a model that is beneficial for both forecasting and explanation, enabling analysts and specialists to understand the potential shortcomings of a given framework and search out the most appropriate corrective measures. TAM's main objective is to establish a foundation for observing how external factors affect internal convictions, attitudes, and intentions. TAM was developed in an effort to achieve these goals by identifying a few fundamental central variables suggested by earlier research managing the psychological and practical determinants of computer acceptance and using TRA as a hypothetical setting for demonstrating the potential relationships between these variables (Davis et al., 1989).

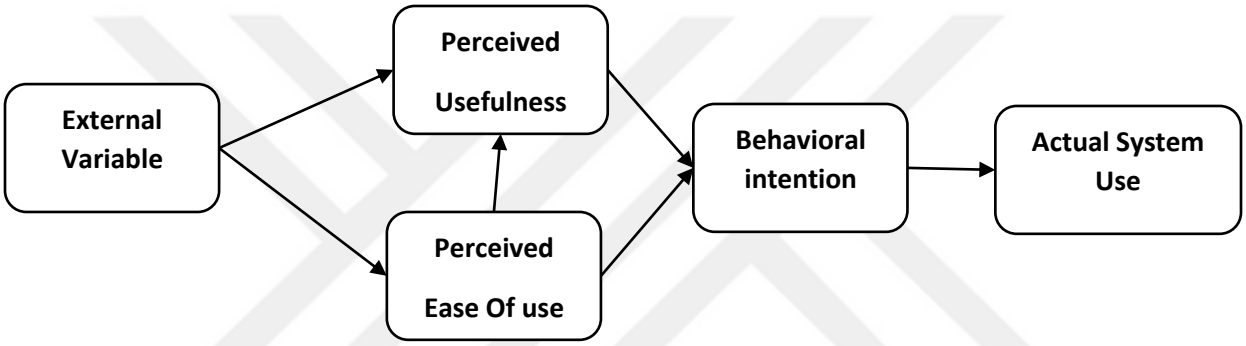


**Figure 11:** The Technology Acceptance Model

**Source:** Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. Management Information Systems Quarterly.

### 1.7.2. Technology–organization–environment (TOE):

Tornatzky and Fleischer created the TOE framework to study how diverse IS/IT products and services are adopted at the firm level (1990). It has become a well-known theoretical approach on IT adoption (Zhu et al., 2004). TOE provides an edge over other adoption models in evaluating technology adoption, technology use, and value creation from technological innovation due to the inclusion of technological, organizational, and environmental variables (Hossain & Quaddus, 2011; Oliveira & Martins, 2010; Ramdani et al., 2009; Zhu & Kraemer, 2005).

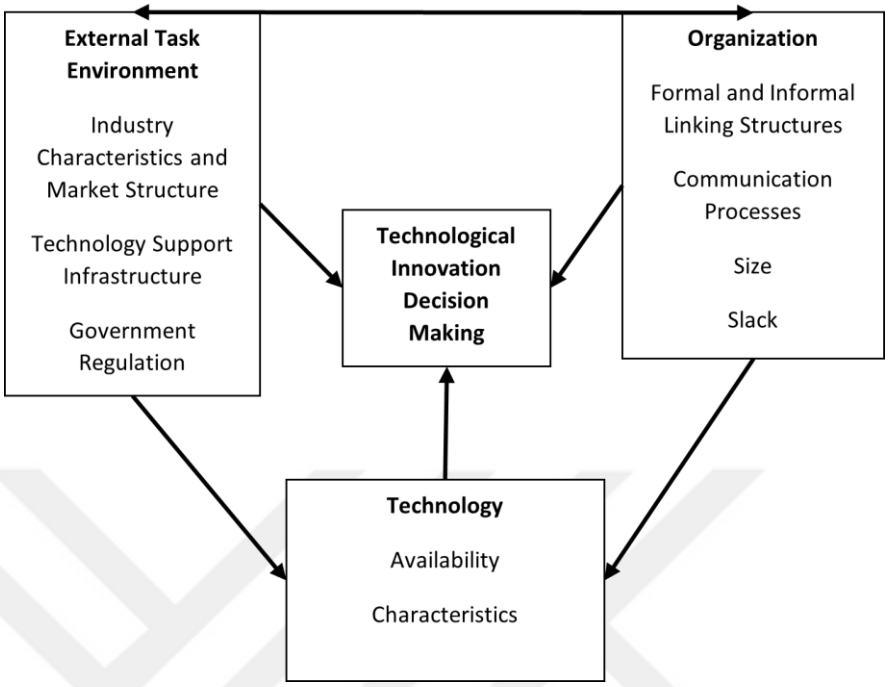


**Figure 12:** Technology–organization–environment (TOE)

**Source:** Tornatsky, L.; Fleischer, M. the Process of Technology Innovation; Lexington Books: Lexington, MA, USA, 1990.

Three key determinants were distinguished that influence organizational adoption: technology, organization, and environment:

#### 1.7.2.1. Technological Context

The TOE framework states that technology variables for an organization include both internal and external technology (Ngah & Thurasamy, 2017). In recent years, many companies' internal processes, supply processes and customer relationship processes have undergone a process of digitalization through the use of advanced technologies such as big data analytics, cloud computing and ERP platforms (Geisberger & Broy, 2012). However, the implementation of these technologies in the retail industry may be hindered if customers and other stakeholders find them difficult to use. For example, if the retail industry has a low level of learnability, it would be impractical to implement flexible and agile technology solutions for managing inventory and customer demand.

#### 1.7.2.2. Organizational Context:

Based on the TOE framework, the Organizational context describes the organizational fundamental characteristics (i.e., organization size and architecture) that impact the adoption of an innovation (Ngah et al., 2017).

According to Hassan et al. (2015) the term organizational context refers to descriptive measurements about the organization, including its size, top management support, complexity of its managerial hierarchy, scope (the horizontal reach of its operations), structure, and resources.

For an organization to effectively implement advanced supply chain technology, the active involvement and guidance of upper management is essential. The leadership team must effectively communicate the objectives and integration of digitalization into the overall strategy, ensuring alignment across all departments (Maduku et al, 2016).

#### 1.7.2.3. Environmental Context:

The external factors that shape the organization's context refer to the extent to which the industry dynamics, government regulations, and technology providers in the market can influence the adoption of technology. This includes factors such as industry structure, customer preferences, and competitive pressures (Ngah et al, 2017). The perceived industry advantage can significantly influence the organization's decision to adopt technology, as firms may be more inclined to implement new innovations if they believe that failure to do so would result in a competitive disadvantage, such as the loss of potential customers (Wang et al., 2015). Organizations' primary goal is to satisfy the requirements of their clients, and because of this, they unintentionally feel pressured to implement new innovations (Alshamaila et al., 2013).

### 1.7.3. A Hybrid Model TAM & TOE Integration:

This study, based on an extensive literature review, examines the relevance of two technology adoption models, specifically the Technology Acceptance Model (TAM) and the technology, organization, and environment (TOE) framework, in relation to the implementation of end-to-end supply chain enterprise resource planning platforms.

In this research a hybrid model has been used, the Technology Acceptance Model and Technology Organization Environment System which have been employed in several studies in IT and data innovation (Qin and al, 2020). Even though, numerous empirical and conceptual

research have established the importance, preeminence, and applicability of the TAM model and TOE framework in understanding technology adoption; nonetheless, each model has its own flaws. The model suggests perceived usefulness (PU) and perceived ease of use (PEOU) as the primary drivers of IT adoption by taking into account an individual's goals when employing a system or application. It has been noted through prior research that the combination of the two constructs under examination in this study, account for a substantial proportion, approximately 40%, of the utilization of the system under investigation (Legris et al., 2003). However, the definition of the TAM external variable is not concise and differ from context to context, on the other side, TOE contains ambiguous primary constructs and is too broad (Wang et al., 2010). The TOE framework must be reinforced by merging it with models that have distinct constructs. As a result, academics have recommended for the integration of TAM and TOE in order to increase the prediction accuracy of the resultant model and overcome some of their particular limitations (Bryan & Zuva, 2021).

Several pieces of research have been realized to study the customer adoption intention regarding the digital supply chain management in multiple fields and industries, some of these pieces used each model independently, some others integrated them as it suggested in our study. According to Dianiels and Jokonya (2020) who applied the TOE framework to determine the variables affecting the adoption intention of digital transformation in SCM within the retail industry, concluded that the most technological factors influencing the technology adoption are complexity, compatibility, cost and security influence, consequently, technologies are adopted in SCM when it is beneficial for the organization while being cost-effective and offering data security protection due to the competitiveness reasons. Resource capabilities have a significant impact on technology adoption from the organizational side, environmentally, market structure has more impact on technology adoption whereas if it is considered as a mature market, it will be more likely to adopt such technologies. Furthermore, there are other influencing variables in the environmental factors such as competition and political dominance.

A recent study by Sheshadri et al (2021) delved into the implementation of Industry 4.0 and the integration of Artificial Intelligence in the manufacturing process. The study presented a conceptual model that combined the Technology Acceptance Model (TAM) and technology, organization, and environment (TOE) frameworks. The research found that in the context of digital

manufacturing and production organizations, the correlations between the constructs were found to be significant, with the exception of the factors of organizational readiness, organizational compatibility and partner support on perceived ease of use.

## 1.8. Hypothesis Development and Research Framework

External and internal factors are included in the suggested conceptual model, Perceived usefulness and Perceived ease of use are TAM-based technological variables, whereas, the TOE framework, variables vary from a sector to another, hence, there isn't a combination of factors that can be applied generally across specific contexts and platforms to explain technology adoption. In order to present a conceptual framework and its hypotheses, adoption variables pertinent to End-To-End ERP platforms are chosen based on the literature.

#### 1.8.1.1. Relative Advantage

Advantages of a technology play a major role in technology adoption, according to Rogers (2003) in his book, relative advantage is defined as the degree to which an innovation is seen as superior to the concept it replaces where economic profitability is a common way to express the relative advantage. According to Chiu (2019) traditional ERP's are designed to solve a specific issue across the value chain for instance inventory management, sales management and so on. Whereas a single end-to-end platform enables the company to implement an extensive and integrated end-to-end business-planning strategy that aligns operational and financial planning, enables balanced analytics-based decisions (Wamba et al, 2017), and provides visibility and cross-functionally aligned decisions focused on advancing the company's larger strategic goals. A transactional view of the business and unified data allows the organization to operate as a single process, enhancing insights and choices (Molla & Licker, 2002). Li & Fung ERP platform has been succeeded to deploy the 3D sampling design and a virtual fashion show, consequently, it results in minimizing sampling duration from weeks to couple of days and shipping cost as well as eliminating unnecessary samples. These virtual designs are used in the marketing and e-commerce sites once the sales phase is achieved (Fung, 2017) hence the following hypotheses are proposed:

*H1a: Relative Advantage has a positive influence on perceived usefulness to adopt End-To-End ERP platforms*

*H1b: Relative Advantage has a positive influence on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.2. Complexity

Perception of complexity is a measure of the extent to which an innovation is deemed challenging to comprehend and operate by individuals (Rogers, 2003). In case of ERP platforms, the complexity is measured as the degree of hardness and the time required to perform the operations through the platforms, how fast can effective decisions could be made, the innovation features' performance and the user interface (Parveen & Sulaiman, 2008). Higher complexity causes more mental strain and work, which consequently reduces usefulness and usability (Sokol, 1994). Employees who work for organizations with complicated systems may have difficulty utilizing new technology and won't be able to appreciate its value, hence this complexity may have a negative impact on users' attitudes toward using the system (Basoglu et al, 2007; Chang et al., 2008). Hence the following hypotheses are proposed:

*H2a: Complexity has a negative influence on perceived usefulness to adopt End-To-End ERP platforms*

*H2b: Complexity has a negative influence on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.3. Compatibility

Compatibility is defined as the degree to which an invention is viewed as being consistent with the current values, previous experiences, and needs of potential adopters (Rogers, 2003). The incompatibility issue is considered a typical problem with the implementation of ERP systems which comes from the poor adaptation of the ERP systems with business processes (Chen et al, 2009). Several studies in digital supply chain adoption have stated that compatibility has an influence on PU and PEOU. According to Tsai et al. (2010) in ERP platforms, implementation and business needs should be highly related since these systems are created to support operations like product design, manufacturing, purchasing, or distribution. In case of textile end-to-end supply chain platforms, users' needs are satisfied by designing their items using digital sampling, raw material sourcing and orders tracking till the end consumer delivery. According to Gangwar et al. (2015) it is recognized as well, when technology innovation have higher integrity with

organization’s technology architecture, the organization will be able to build more capacity to employ the benefits of technology adopted and more is the prospect of lowering the level of confusion among technology users. Thus, it has been hypothesized that a technology innovation's adoption is facilitated by a higher degree of compatibility with the technical systems, operational procedures, and value and belief systems of the adopting unit (Cooper et al, 1990). Hence the following hypotheses are proposed:

*H3a: Compatibility has a positive influence on perceived usefulness to adopt End-To-End ERP platforms*

*H3b: Compatibility has a positive influence on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.4. Cost

According to Brown and Russell (2007) the costs connected with new technology have significant influence on the decision to adopt it. New technology is typically expensive to install (Hoske, 2004) and the literature even identifies cost as a barrier to technology adoption (Tornatzky & Klein, 1982). Perceived cost is related to the fact that if customers believe the cost of implementing ERP would be significant, they will be unwilling to use it effectively, which could have a negative impact on their decision to adopt the technology (Suebsin & Gerdsri, 2009). According to Elragal and El Kommos the deployment of an end-to-end ERP systems rather than traditional ERP is impacted by couple of cost-drivers (2012). These factors include data collection, data migration, training, HR, licensing, hardware, and software. As well as the advantages acquired from end-to-end platforms once the key components of the supply chain are digitized from product development, material costings and sampling, to the final creation and delivery of products, it is generated an end-to-end platform that will make customers’ processes more effortless and cost effective (Fung, 2017). Hence the following hypotheses are proposed:

*H4a: Perceived Cost has a positive influence on perceived usefulness to adopt End-To-End ERP platforms*

*H4b: Perceived Cost has a positive influence on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.5. Organizational Readiness

Organizational readiness can be defined as the organization's capability to access and utilize the necessary resources required for the adoption and implementation of new technology. It encompasses the organization's ability to provide the required infrastructure, support and resources to facilitate the successful implementation of technology (Iacovou et al, 1995). According to Molla and Licker (2005) the definition of this perceived readiness included managers' assessments at which extent they thought their company had the awareness, resources, commitment, and governance in order to adopt a new technology. Musawa and Wahab (2012) stated the level of the company's financial and technological resources was referred to as organizational readiness. Financial readiness was defined as the ability to pay for the end-to-end platforms' implementation, any ensuing improvements, and ongoing costs during use. As well as the sophistication of IT usage and management in an organization was referred to as technological readiness. The workers of an organization will feel confined concerning the usage of this new system if a company is not prepared to adopt it, and they will not see its value, hence, the following hypotheses can be proposed:

*H5a: Organizational readiness has a positive influence on perceived usefulness to adopt End-To-End ERP platforms*

*H5b: Organizational readiness has a positive influence on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.6. Technical Skills and Training

In terms of both quality and quantity, training refers to the extent to which a business trains its staff on how to use a new technology (Schillewaerta et al, 2005). Whereas employees' technical skills are related with the notion of their skill, expertise, capacities, and other important attributes required for efficient productivity related to a new technology adoption (Long et al, 2013). According to Lutovac and Manojlov (2012) enterprise resource planning systems are extremely complex and require extensive training. Even though these E2E platforms are innovative and cost-saving technologies, their adoption is challenging and perplexing due to the fact that it requires high skills and training; otherwise, a major driver for ERP failure implementation will be a lack of training and skills. It has been found by Lee et al. that lacking particular training and skills made employees of a company dissatisfied and ultimately demotivated, spending more time and effort

on adopting ERP solutions (2013). Employee stress and anxiety related to using the ERP system will be reduced by training and skills development, which will also result in a greater understanding of the advantages and usefulness of the system. Hence, the following hypothesizes are proposed:

*H6a: Technical Skills and Training has a positive influence on perceived usefulness to adopt End-To-End ERP platforms*

*H6b: Technical Skills and Training has a positive influence on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.7. Competition Advantage

The degree at which a technological component appears to deliver a greater benefit to companies is characterized as the level of competition advantage (Rogers, 2003). Companies are more likely to adopt innovations if the current company believes that rejecting them will put it at a competitive disadvantage, such as losing potential customers (Wang et al, 2015). Moreover, the personnel of organization early technology adopters will be impacted by acquiring a competition advantage over competing businesses because they get comfortable in their advantageous position (Press, 2016). For example, in the retail sector, the integration of Artificial Intelligence technology, including machine learning, deep learning, and natural language processing within the enterprise resource planning systems, can provide organizations with a competitive advantage by providing valuable insights that would otherwise be unavailable (Curran & Pureel, 2017). The following hypotheses are proposed:

*H7a: Competition advantage has a positive influence on perceived usefulness to adopt End-To-End ERP platforms*

*H7b: Competition advantage has a positive influence on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.8. Partner Support

Partner support describes the accessibility of services like vendor system training and technical help for the setup and use of an innovation system, as it is known that without collaborative support, any innovation's potential cannot be realized (Kinuthia & Njenga, 2014). In

our case, the providers of E2E ERP services are always required to guarantee the availability of data, or more precisely, it must be available when users need it (Kim et al, 2009). User training and technical support are considered among the vendor duties, hence, vendors of end-to-end ERP are required to hire and train appropriate support staff in order to give their customers the best service possible (Wong et al, 2020). Many businesses are hesitant to store their internal data on servers that are not owned by them and may be co-stored with the applications of other businesses (Katzan, 2010). For this reason, security and privacy is a big concern and required to be guaranteed in order to adopt such platforms. Hence we propose the following hypotheses:

*H8a: Partner Support has a positive effect on perceived usefulness to adopt End-To-End ERP platforms*

*H8b: Partner Support has a positive effect on perceived ease of use to adopt End-To-End ERP platforms*

#### 1.8.1.9. Perceived usefulness and Perceived ease of use impact on adoption intention

According to Li (2008) and Au and Zafar (2008) perceived usefulness PU and perceived ease of use PEOU are the primary determinants of system utilization with TAM. PU is described as the user's subjective assessment of how using a particular system will improve their job performance within an organizational setting, and encompasses concepts such as subjective norms, results quality, image and job relevance (Venkatesh & Bala, 2008). These factors led us to hypothesize that people estimate perceived usefulness in part as a result of conceptually evaluating what a technology has the ability to do with what they must complete for their objectives (Venkatesh & Davis, 2000). While the PEOU definition states that it refers to "the extent to which the prospective user anticipates the target system to be free of effort" (Zhu et al, 2003). PEOU includes the concepts, computer self-efficacy, computer anxiety, and computer playfulness, and perceptions of external control (Venkatesh & Bala, 2008). This leads us to hypothesize that people's perception of ease of use is influenced by how easy it is to use a system, which in turn motivates them to intend to use the system. (Venkatesh & Davis, 2000). It is already stated as well by Davis TAM confirms that PEOU determines usefulness (1986). Therefore, we hypothesize the following hypothesis:

*H9: Perceived ease of use positively influences perceived usefulness*

Technology acceptance model has been effectively employed in several studies to describe a user's adoption of any new technology or innovation (Lee et al., 2003). In this study, technology acceptance model has been applied in order to illustrate the intention to adopt of end-to-end ERP platforms in an organization, hence, it is believed that a user would be more likely to adopt new technology if they felt it was easy and useful to use. Therefore, we hypothesize the following:

*H10a: Perceived usefulness has a positive impact on E2E ERP adoption intention*

*H10b: Perceived ease of use has a positive impact on E2E ERP adoption intention*

# 2. Research Methodology

This research is about analyzing the factors that influence the adoption intention to use End-To-End ERP technology by the textile retail industry users. The next parts will give a more comprehensive methodology for research and data collecting.

## 2.1 Research Objectives

In this research, user behavior is examined in the context of digital supply chain technology, where the main purpose of this research is to understand the adoption of end-to-end platforms by textile retailers.

This study aims to understand and analyze the impact of using end-to-end platforms in supply chain management. By applying the integrated model TOE-TAM we will determine what are the factors influencing customer acceptance and adoption of end-to-end platforms in supply chain management.

A Hybrid model will be used in order to explore the factors influencing the adoption of digital supply chain end-to-end platforms in the retail industry sector, the Technology Acceptance Model (TAM) to study the adoption at the individual level and the Technology-Organization-Environment Model (TOE) at the organizational level.

TAM fails to give details regarding the organization, based on this limitation, it was essential to be integrated with another model (Awa, 2012). The combination of the two models results in a new and unique generated redesign that advances and encourages enhanced informative

and prescient focal points of IT adoption while also increasing the outcome's predictive power taking into consideration the organizational and technological variables of the TOE Model as external variables of the TAM model, the latter with its two variables perceived usefulness and perceived ease of use will represent the mediating variables in this research between the external variables and the adoption intention.

We aimed to identify the most crucial factors that influence whether adoption continues or discontinues based on the hypothetical relationship between the variables mentioned above and the adoption intention. As a result, we were able to investigate and comprehend the profile of the textile industry sector. Numerous studies and articles about digital supply chain tools are included in the literature review along with the previous variables. However, the literature review does not discuss the issue of the relationship between the adoption intention to utilize E2E ERP platforms and the previous variables PU, PEOU, and TOE. Particularly in the textile industry sector, where research on these technologies and those looking at consumers' intentions to use this technological service are limited.

## 2.2 Research Model Development

Figure 13 illustrates the research model; this conceptual model has been developed based on previous research. The customer adoption intention will be clarified, with the conceptual framework which is developed using organizational and technological variables of TOE Model as external variables of TAM model, the latter with its two variables perceived usefulness and perceived ease of use will represent the mediating variables in this research between the external variables and the adoption intention, which will be the technological, organizational and environmental variables.

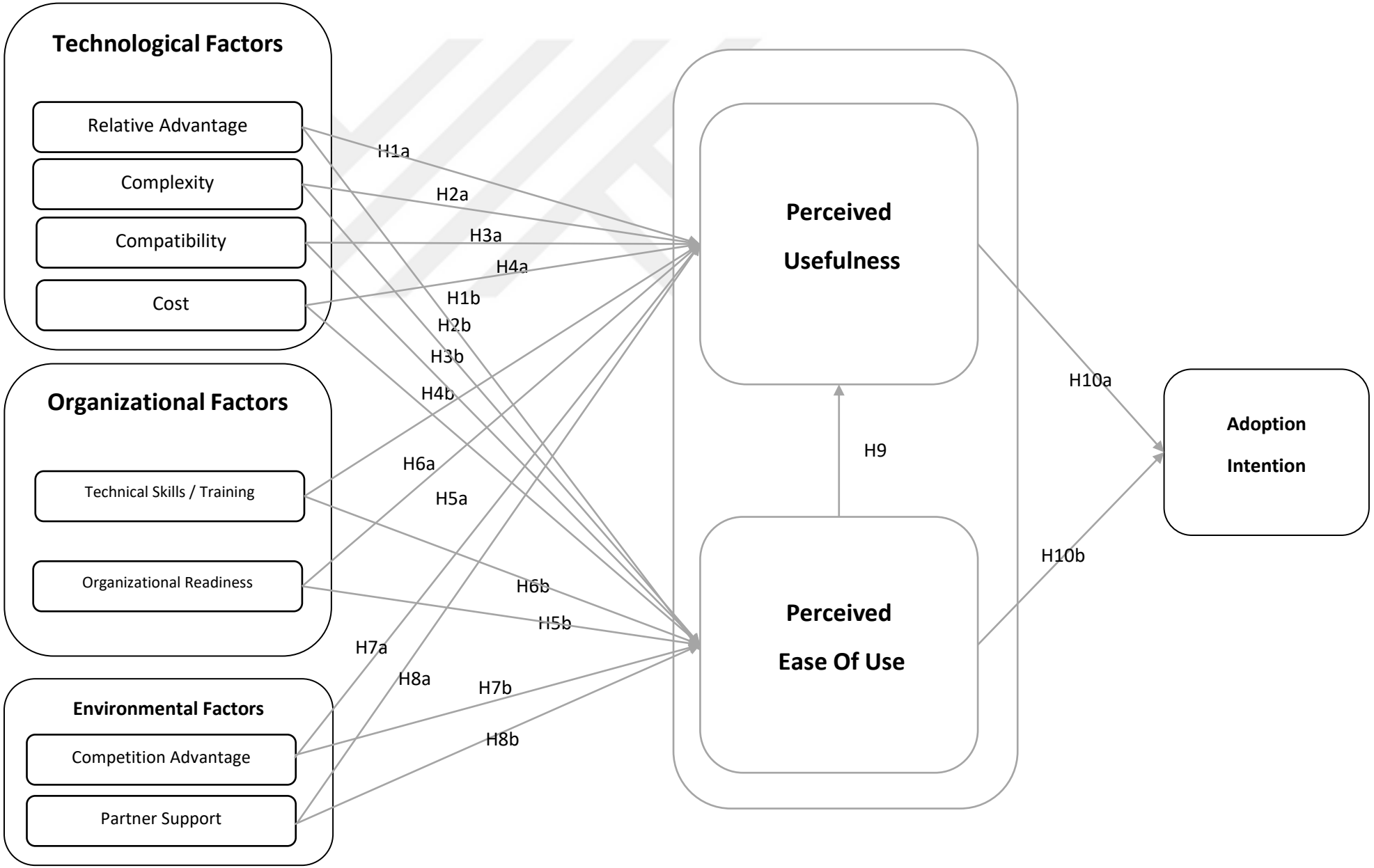


**Figure 13:** Conceptual Research Model

## 2.3 Instrument

A multi-item questionnaire is used to measure the variables. The questionnaire is started by asking the respondent whether they have already implemented the End-to-End ERP or not yet, and if they are willing to implement it sooner. After that, couple of demographic questions have been asked to the respondents such as Region, Firm size, Department and year of establishment to determine the respondent's differentiation.

Next, the following question groups are used in order to measure several constructs. The constructs measured regarding the technological factors are the following:

**Relative Advantage** five items have been asked to the respondents in order to measure it, they were asked in case of using E2E ERP, if they can access information in real time from any place, additionally, if they can access all shared resources on the platform for example 3D sampling tool, and if their order accuracy has been improved (Gangwar et al, 2015). Two other questions in this construct have been asked as well, if they are able to track and consult all the product information from its idea till the delivery to the final consumer, and whether if they are able to reduce the production costs and delivery time using the digital tools 3D and digital Fashion-Walk (Kinuthia, 2014).

**Complexity**: four items have been used to measure it, the respondents have been asked if the use of E2E ERP with the existing legacy system, is a complex task for their organization (Parveen & Sulaiman, 2008). They were asked if the AI tools of E2E Supply chain ERP are not easy to use and if the E2E ERP is complex to use (Bhardwaj et al, 2021). The participants have been asked whether the use of E2E ERP functionalities simultaneously takes too much of their time (Gangwar et al, 2015).

**Compatibility**: Five items have been used to measure the compatibility, the respondents were asked if the E2E ERP if compatible with the firm's IT infrastructure (Geczy et al, 2012), and if the integration of E2E ERP Platforms in their IT architecture will be manageable (Peng et al, 2012), and they were asked if the ERP system matches their current processing procedure (Rajan & Baral, 2015). Two other questions have asked to the participants about the obligation of following the philosophy of the ERP vendor once the ERP is adopted, and if the changes caused

by the adoption is compatible with the existing operating practices (Byungchan & Hyunchul, 2020).

**Cost**: Three items have been asked to measure the cost variable, the respondents have been asked if the adoption of E2E ERP has been cost effective for their organization (Haans et al, 2016), and if the E2E ERP AI tools have served to reduce product cost (Byungchan & Hyunchul, 2020).

The following measured constructs are related to the organizational factors:

**Organizational Readiness**: Three Items have been asked related to this variable, if they have all the human resources dedicated in order to adopt the E2E ERP (Aboelmaged, 2014), if they have sufficient technological resources to implement the ERP and if they have the ability to pay for the end-to-end platforms' implementation, upgrades and ongoing costs (Gangwar et al, 2015).

**Technical Skills and Training**: Four Items have been asked in order to measure it, they were asked if they have AI experts in their organization (Maduka et al, 2018), they were asked as well if their company provide them training in using E2E ERP, and if their level of understanding has been improved after going through this training, and if this training gave them confidence in use of E2E ERP (Gangwar et al, 2015).

The following measured constructs are related to the Environmental factors:

**Competition Advantage**: 2 items have been asked to measure the competitive effect where the participants have been asked if the implementation of E2E ERP will keep them competitive in the market, and if they are aware that many firms in the same sector are moving toward AI based tools (Kinuthia, 2014).

**Vendor Support**: Four items have been asked to measure the partner support, the participants were asked, if their vendor has provided them with technical assistance (Chatterjee et al, 2021), if their vendor will ensure the strong access, identity management and the privacy of sensitive data, the respondents were asked about the difficulty to change the ERP due to legal and contractual restrictions (Byungchan & Hyunchul, 2020).

The following measured constructs are related to the Environmental factors:

**Perceived usefulness**: Three Items have been asked in order to measure the usefulness of the E2E ERP, questions were about the supply chain performance got improved once the ERP is

adopted (Byungchan & Hyunchul, 2020), if the E2E ERP adoption will enhance their supply chain cost optimization, and if the adoption will lead them to achieve their objective quicker (Chatterjee et al, 2021)

**Perceived Ease of Use**: Three items were asked to assess the ease of use of E2E ERP, the participants were asked if the use of AI tools are easy to use (Bhardwaj et al, 2021), if the process and structure of E2E ERP is understandable (Gangwar et al, 2015).

**Adoption Intention**: Three items have been used in order to measure the adoption intention, where the participants are asked if they intend to use the E2E ERP and in general if they think that using E2E ERP is worth and advantageous for their organization (Gangwar et al, 2015).

These constructs will serve to measure the adoption intention of End-To-End ERP platforms. All the items of the construct have been asked to be responded on a 5-point interval scale (1 = Strongly Agree to 5 = Strongly Disagree).

In order to gather as much data as possible and to increase the sample size from around the world, the questionnaire was translated into French utilizing appropriate literature sources and back translation techniques. See Appendix for both the English and French versions of the questionnaire.

## 2.4 Sample and Data Collection

In our study, the sample unit will be the department managers and directors involved in the textile industry supply chain, who have already implemented the End-To-End Supply Chain ERP, or willing to.

We employed non-probability sampling strategies, such as the snowball sampling technique and the convenience sampling technique, to acquire the data.

The data has been collected using an online questionnaire where the target population which are exercising in the supply chain sector have responded to the survey, the questionnaire has been implemented in Google Forms platform, after that, a Pilot test has been realized with the first 10 respondents in the goal of verifying the coherence of the questionnaire and whether the questions are comprehensible or not.

The data collection has taken a period of almost one month, all the respondents in the survey are working in the textile retail companies in different departments (IT, Finance, Export, Top Management, Production), moreover, E2E ERP vendors are also reached such as the LI & Fung workers, all of these respondents have been reached via the LinkedIn social media platform through the premium extension "Sales Navigator", where it provides lists of companies exercising in the field of textile, Approximately more than 900 requests have been sent to respond the questionnaire, a total of 396 positive answers have been acquired

## 2.5 Data Analysis Method:

Partial least squares path Modeling (PLS-PM) for structural equation model estimation and hypothesis testing is used to analyze the results. PLS-PM is used since it is a regression-based approach that minimizes the residual variances of variables (Hair et al. 2019). When we have a complicated scenario involving variables and wish to evaluate their direct, indirect, and mediating interaction, PLS can be employed as a SEM approach (Hair et al. 2019).

# 3. Research Findings:

## 3.1 Descriptive Analysis of the research:

The aim of descriptive analysis is to offer a better knowledge of the features, demographics, and company orientation of employees in the textile retail industry.

### 3.1.1 Demographic Analysis of Research Sample

The sample size with a total of 396 responses is dominated by the companies which they have a size firm between 1-50 employees with a frequency of 117, 106 responses for the companies having from 51-100 employees, third, companies having from 101-500 employees with 66 responses, 62 responses for the companies which are having employees between 1001 and 5000, 45 responses for the companies which are having 501employees to 1000. The sample size has been classified as well by department, where the biggest part respondent is for IT department with 159responses, next the top management department with 134responses, finance department with 54responses, 33, 16 responses for export department and consultants. The respondents' companies have been classified by region where multinational companies where the most respondents with 234 responses, the remaining 162 company are operating locally.

**Table 1:** Demographic Analysis of Research Sample

| | Distribution | Frequency | Percentage |
|---|---|---|---|
| **Region** | Local | 162 | 40,9 |
| | Multinational | 234 | 59,1 |
| | **Total** | 396 | 100 |
| **Department** | ERP Consultant | 16 | 4 |
| | Export | 33 | 8,3 |
| | Finance | 54 | 13,6 |
| | IT | 159 | 40,2 |
| | Top Management | 134 | 33,8 |
| | **Total** | 396 | 100 |
| **Firm Size** | 1-50 | 117 | 29,55 |
| | 1001-5000 | 62 | 15,66 |
| | 101-500 | 66 | 16,67 |
| | 501-1000 | 45 | 11,36 |
| | 51-100 | 106 | 26,77 |
| | **Total** | 396 | 100 |

### 3.1.2 Distribution of End-to-End ERP platform User

**Table 2:** Distribution of End-to-End ERP platform User

| Implementation | | Firm Size | Local | Multinational | Total | Total |
|---|---|---|---|---|---|---|
| **Not Using E2E** | **Not willing** | 1-50 | 11 | 22 | 33 | 81 |
| | | 51-100 | 14 | 18 | 32 | |
| | | 101-500 | 9 | 7 | 16 | |
| | **Soon use** | 1-50 | 15 | 20 | 35 | 85 |
| | | 51-100 | 11 | 14 | 25 | |
| | | 101-500 | 10 | 13 | 23 | |
| | | 501-1000 | 1 | 1 | 2 | |
| **Using E2E** | **Yes** | 1-50 | 19 | 30 | 49 | 230 |
| | | 51-100 | 22 | 27 | 49 | |
| | | 101-500 | 14 | 13 | 27 | |
| | | 501-1000 | 17 | 26 | 43 | |
| | | 1001-5000 | 14 | 33 | 47 | |
| | | 5001-10000 | 2 | 6 | 8 | |
| | | >10000 | 3 | 4 | 7 | |
| **Grand Total** | | | 162 | 234 | 396 | |

The sample size is divided to users and non-users of End-To-End ERP, 230 respondents are using E2E ERP, while 166responses are still not using E2E ERP, 81one of them are not willing to use ERP, 85 companies are willing to implement E2E ERP soon, the Table 2 represents the users and non-users illustrated by the firm size and the region.

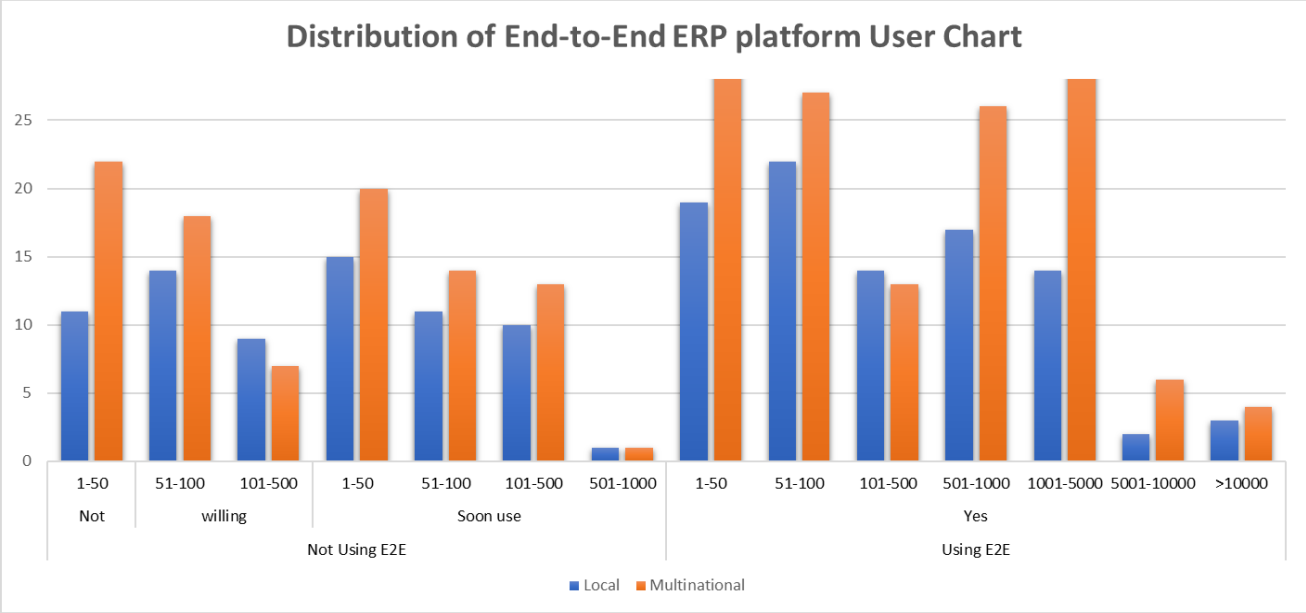


**Figure 14:** E2E ERP Platform Users

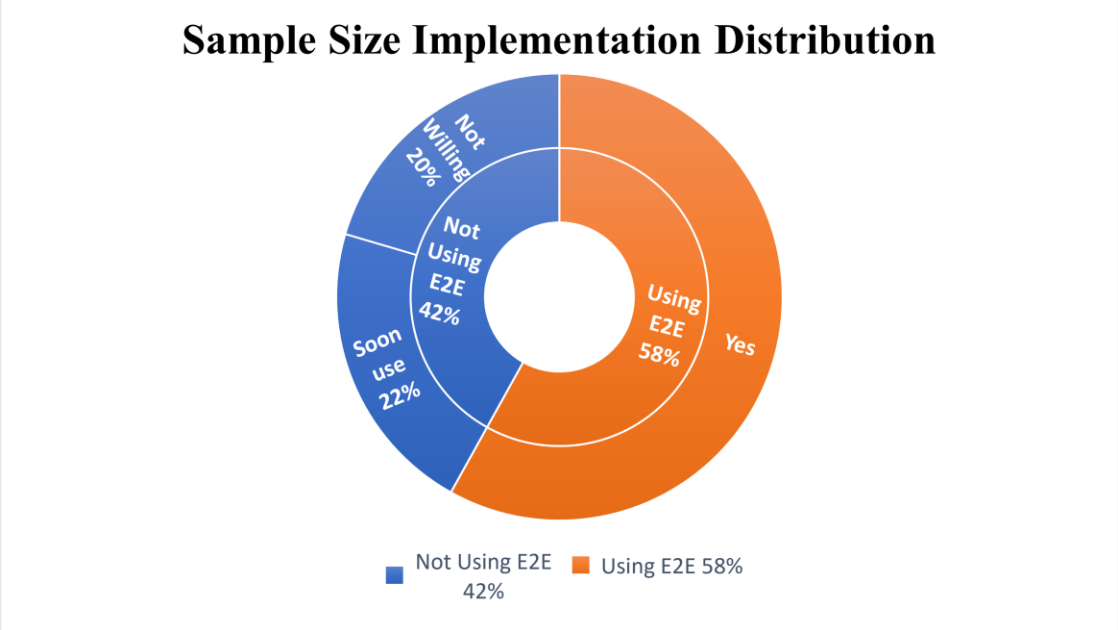


**Figure 15**: Sample Size by E2E Implementation
**Source:** Developed by the Researcher

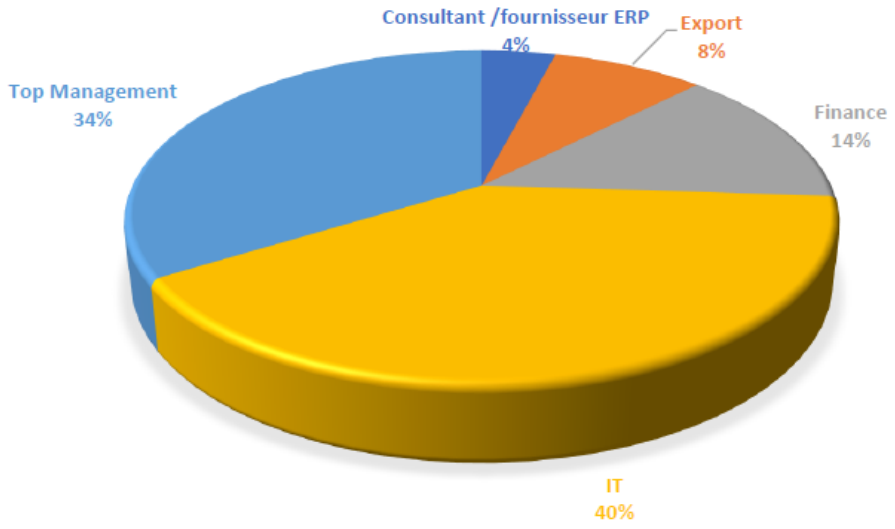


**Figure 16**: Sample Distribution by Department
**Source:** Developed by the Researcher

The samples size has been illustrated above, where the illustration has given 42% of the sample size as the participants which are not using the E2E ERP, 20% of them are not willing to use the E2E ERP, 22% are planning to implement soon, whereas, 58% of the sample size are using the E2E ERP.

From the departments' point of view, 40% are responding from the IT department, 34%, 14% are from Top management, Finance respectively.

## 3.2 Measurement Model Analysis

Before testing the research model, measurement model was analyzed for its validity and reliability. To test the convergent validity, two criteria have been used Composite Reliability and the Average Variance Extracted in order to check that the findings were within acceptable limits, Factor loadings and Composite Reliability coefficient values of 0.7 and above are widely accepted as suggested by Benitez et al. (2020). The study had the following measurement scales: Relative Advantage (5 items), Compatibility (5 items), Complexity (4 items), Cost (3 items), Technical Skills and Training (4 items), Organization Readiness (3 items), Partner Support (4 items), Competitive advantage (2 items).

**Table 3**: Evaluation of Scales for Reliability and Convergent Validity

| Constructs | Items | Factor Loadings | Rho A | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|---|---|
| **Adoption intention** | ADI1 | 0.809 | 0.771 | 0.862 | 0.677 |
| | ADI2 | 0.790 | | | |
| | ADI3 | 0.867 | | | |
| **Competitive Advantage** | CA2 | 0.839 | 0.471 | 0.788 | 0.650 |
| | CA3 | 0.772 | | | |
| **Compatibility** | CP1 | 0.746 | 0.797 | 0.859 | 0.549 |
| | CP2 | 0.786 | | | |
| | CP3 | 0.749 | | | |
| | CP4 | 0.724 | | | |
| | CP5 | 0.696 | | | |
| **Cost** | CS1 | 0.840 | 0.778 | 0.871 | 0.692 |
| | CS2 | 0.853 | | | |
| | CS3 | 0.802 | | | |
| **Complexity** | CX1 | 0.754 | 0.828 | 0.871 | 0.629 |
| | CX2 | 0.814 | | | |
| | CX3 | 0.840 | | | |
| | CX4 | 0.761 | | | |
| **Organization Readiness** | OR1 | 0.747 | 0.782 | 0.861 | 0.675 |
| | OR2 | 0.861 | | | |
| | OR3 | 0.853 | | | |
| **PEOU** | PEOU1 | 0.824 | 0.748 | 0.856 | 0.664 |
| | PEOU2 | 0.848 | | | |
| | PEOU3 | 0.771 | | | |
| **Partner Support** | PS1 | 0.801 | 0.723 | 0.810 | 0.518 |
| | PS2 | **0.672** | | | |
| | PS3 | 0.777 | | | |
| | PS4 | **0.613** | | | |
| **Perceived Usefulness** | PU1 | 0.871 | 0.787 | 0.870 | 0.690 |
| | PU2 | 0.802 | | | |
| | PU3 | 0.818 | | | |
| **Relative Advantage** | RA1 | **0.677** | 0.812 | 0.861 | 0.555 |
| | RA2 | 0.767 | | | |
| | RA3 | 0.716 | | | |
| | RA4 | 0.814 | | | |
| | RA5 | 0.744 | | | |
| **Technical Skills / Training** | TST1 | 0.765 | 0.841 | 0.891 | 0.671 |
| | TST2 | 0.815 | | | |
| | TST3 | 0.886 | | | |
| | TST4 | 0.807 | | | |

As summarized in Table 3 below, all the scales used in this study exceeded the generally accepted Composite Reliability coefficient value of 0.7. The values are as follows: for Relative Advantage was 0.861, 0.859 for Compatibility, 0.871 for Complexity, 0.871 for Cost, 0.861 for Organization Readiness, 0.891 for technical skills and training and 0.862 for Adoption intention, Values of 0.788 for competitive Pressure, 0.810 for Partner Support, all the Composite Reliability values and Average Variance Extracted (AVE) values are higher than 0.7 and 0.5 Respectively as it is suggested (Cohen, 1988).

Discriminant validity test (Fornell & Larcker, 1981) was performed to statistically prove if the questions can adequately represent their own constructs and only weakly correlate with other constructs. Table 4 illustrates the square roots of AVE, represented in the diagonal cells of the table, and the correlation coefficients with other variables, represented in the off-diagonal cells of the table.

**Table 4:** Evaluation of Discriminant validity

| | ADI | CA | CP | CS | CX | OR | PEOU | PS | PU | RA | TST |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ADI** | **0.823** | | | | | | | | | | |
| **CA** | 0.634 | **0.806** | | | | | | | | | |
| **CP** | 0.583 | 0.661 | **0.741** | | | | | | | | |
| **CS** | 0.711 | 0.638 | 0.724 | **0.832** | | | | | | | |
| **CX** | 0.064 | 0.208 | 0.339 | 0.210 | **0.793** | | | | | | |
| **OR** | 0.505 | 0.435 | 0.657 | 0.512 | 0.318 | **0.822** | | | | | |
| **PEOU** | 0.710 | 0.709 | 0.708 | 0.688 | 0.207 | 0.619 | **0.815** | | | | |
| **PS** | 0.576 | 0.633 | 0.635 | 0.626 | 0.323 | 0.561 | 0.660 | **0.720** | | | |
| **PU** | 0.689 | 0.706 | 0.549 | 0.654 | 0.069 | 0.420 | 0.689 | 0.667 | **0.831** | | |
| **RA** | 0.708 | 0.641 | 0.729 | 0.691 | 0.199 | 0.554 | 0.656 | 0.559 | 0.693 | **0.745** | |
| **TST** | 0.543 | 0.481 | 0.642 | 0.543 | 0.275 | 0.796 | 0.586 | 0.645 | 0.491 | 0.518 | **0.819** |

## 3.3 The Model's Fit Goodness

The goal for applied researchers should be to demonstrate that a model is a fair approximation of actual events as reflected in a set of data. It is typically suggested that multiple approaches to fit assessment be utilized to accomplish this (MacCallum, 1990). For PLS-SEM, the goodness of fit (GoF) has been created as an overall measure of model fit. In order to check if the model is fit or not, the standardized root mean square residual (SRMR) error has been used as an

index which will measure the mean absolute value of the covariance residuals, and to analyze the difference between the observed correlation and the model implied correlation matrix (Benitez et al, 2020; Maydeu-Olivares, 2017). The results in Table 5 show that Standardized Root Mean Square Residual (SRMR) is smaller than 0.080 as suggested by (Benitez et al., 2020). Hence the model is acceptable.

| Estimated Model | |
|---|---|
| **SRMR** | 0.079 |
| **NFI** | 0.567 |
| **d_G** | 2.499 |
| **d_ULS** | 4.884 |
| **Chi-Square** | 4820.174 |

**Table 5:** Model Goodness of Fit

## 3.4 Structural Model Analysis

In order to investigate the structural model, PLS-PM does a path analysis. Table 6 displays the outcomes of path analysis and hypothesis testing. To establish path significance, the partial least squares regression employs the bootstrapping resampling approach (Henseler et al., 2009). In our situation, we employ PLS bootstrapping and 5000 resamples were taken to complete the bootstrapping.

We have decided to analyze our data across two phases: the first one consists of the separation of E2E users from non-users and performed the analyzes separately, second phase consists of making the analyzes using the our fully aggregated data containing both users and non-users of the ERP, the results of both analyses have the same hypotheses testing results, subsequently, the results as shown in the Table 6.

H1a estimates that relative advantage has a significant effect perceived usefulness as predicted in the literature previously, the results show .000 and 6.835 for p-value and t-value respectively, hence, the first hypothesis is supported. H1b estimates that relative advantage has a significant effect on perceived ease of use, the results statistically prove this relation with the weight t-value 1.056 and .291 for p-value. Thus, the second hypothesis is supported as well, H2a and H2b represent the assumption of negative significance of complexity on the mediating variables perceived usefulness and perceived ease of use, these two hypotheses both have been

found supported, with the values respectively 3.935 and 2.333 for t-values, .000 and .026 for p-values.

The remaining technological factors, compatibility with its two hypotheses H3a, H3b and Cost with its two hypotheses H4a, H4b were found to be having a positive significance on the mediating variables Perceived usefulness and Perceived ease of use, whereas, regarding the organizational factors, the hypotheses H6a, H6b assuming that technical skills and training having a positive significance on the perceived usefulness and perceived ease of use, these hypotheses were not supported in our analysis giving a low result of t-values 1.486 and 0.897 which leads to a high p-value 0.138 and 0.370, the other organizational variable, was found supported with its two hypotheses

H5a and H5b, proving that organizational readiness have a positive significance on the mediating variables perceived ease of use and perceived usefulness. The last external variables analyzed assuming having a positive impact on the mediating variables perceived ease of use and perceived usefulness were competitive advantage and partner support with their hypotheses H7a, H7b and H8a, H8b Respectively, these hypotheses have been found supported. H9 estimates that perceived ease of use has a considerable influence on perceived usefulness, and the data demonstrate a significant t-value =4.008, p-value =.000 effect of PEOU on PU, indicating that this hypothesis is validated.

The results also showed that perceived usefulness H10a and perceived ease of use (H10b) have direct effect on adoption intention of E2E ERP platforms where these two values can explain 58% of the variance of adoption intention.

**Table 6:** Path Weightage and Hypothesis Testing

| N | Hypothesis | Path Weightage | SD | t | p | Decision |
|---|---|---|---|---|---|---|
| **H1a** | RA -> PU | 0.362 | 0.053 | 6.835 | 0.000 | Supported*** |
| **H1b** | RA -> PEOU | 0.064 | 0.060 | 1.056 | 0.291 | Not Supported |
| **H2a** | CX -> PU | -0.125 | 0.032 | 3.935 | 0.000 | Supported*** |
| **H2b** | CX -> PEOU | -0.068 | 0.030 | 2.233 | 0.026 | Supported* |
| **H3a** | CP -> PU | 0.254 | 0.053 | 4.817 | 0.000 | Supported*** |
| **H3b** | CP -> PEOU | 0.118 | 0.050 | 2.348 | 0.019 | Supported** |
| **H4a** | CS -> PU | 0.137 | 0.045 | 3.061 | 0.002 | Supported** |
| **H4b** | CS -> PEOU | 0.180 | 0.046 | 3.940 | 0.000 | Supported*** |
| **H5a** | OR -> PU | 0.109 | 0.055 | 1.970 | 0.049 | Supported* |
| **H5b** | OR -> PEOU | 0.256 | 0.058 | 4.398 | 0.000 | Supported*** |
| **H6a** | TST-> PU | 0.078 | 0.053 | 1.486 | 0.138 | Not Supported |
| **H6b** | TST -> PEOU | -0.058 | 0.065 | 0.897 | 0.370 | Not Supported |
| **H7a** | CA -> PU | 0.257 | 0.052 | 4.913 | 0.000 | Supported*** |
| **H7b** | CA -> PEOU | 0.305 | 0.036 | 8.584 | 0.000 | Supported*** |
| **H8a** | PS_ -> PU | 0.292 | 0.042 | 6.975 | 0.000 | Supported*** |
| **H8b** | PS_ -> PEOU | 0.161 | 0.053 | 3.036 | 0.003 | Supported** |
| **H9** | PEOU -> PU | 0.206 | 0.051 | 4.008 | 0.000 | Supported*** |
| **H10a** | PU -> ADI | 0.374 | 0.049 | 7.567 | 0.000 | Supported*** |
| **H10b** | PEOU -> ADI | 0.457 | 0.038 | 11.943 | 0.000 | Supported*** |

Note. *p < 0.05, **p < 0.01, ***p < 0.001

The R squared value, also known as the coefficient of determination, is an essential parameter for evaluating the structural model in PLS-SEM (Henseler et al., 2009). The proportion of variance in the dependent variable(s) that can be explained by one or more predictor variables is represented by the R-squared value (Elliott and Woodward, 2007).

Although the appropriate level of R2 value varies on the study environment (Hair et al., 2010). Falk and Miller (1992) advise a minimum acceptable level of 0.10. However, Chin (1998) claims that R-squared values of 0.67, 0.33, and 0.19 in PLS-SEM are Strong, Moderate, and weak, respectively. The results are showed in the Table 7

**Table 7: Coefficient of Determination**

| | R Square | R Square Adjusted | Result |
|---|---|---|---|
| **ADI** | 0.581 | 0.578 | Moderate |
| **PEOU** | 0.681 | 0.675 | Strong |
| **PU** | 0.705 | 0.699 | Strong |

Following an evaluation of the overall effect, which is equal to the sum of the direct and indirect effects of constructs via mediation. The overall effect data in Table 8 reveal that as analyzed in the direct effects where the technical skills and training variable has no direct effect to the mediating variables PEOU and PU, or an indirect effect to adoption intention, whereas, the relative advantage does not have an effect to the adoption intention through the mediating variable perceived ease of use, however, it does have an effect to the adoption intention via the mediating variable perceived usefulness, however, regarding the compatibility variable, it turns out that it has a direct effect to the PU and PEOU but it does not have an effect to the adoption intention through the mediating variables.

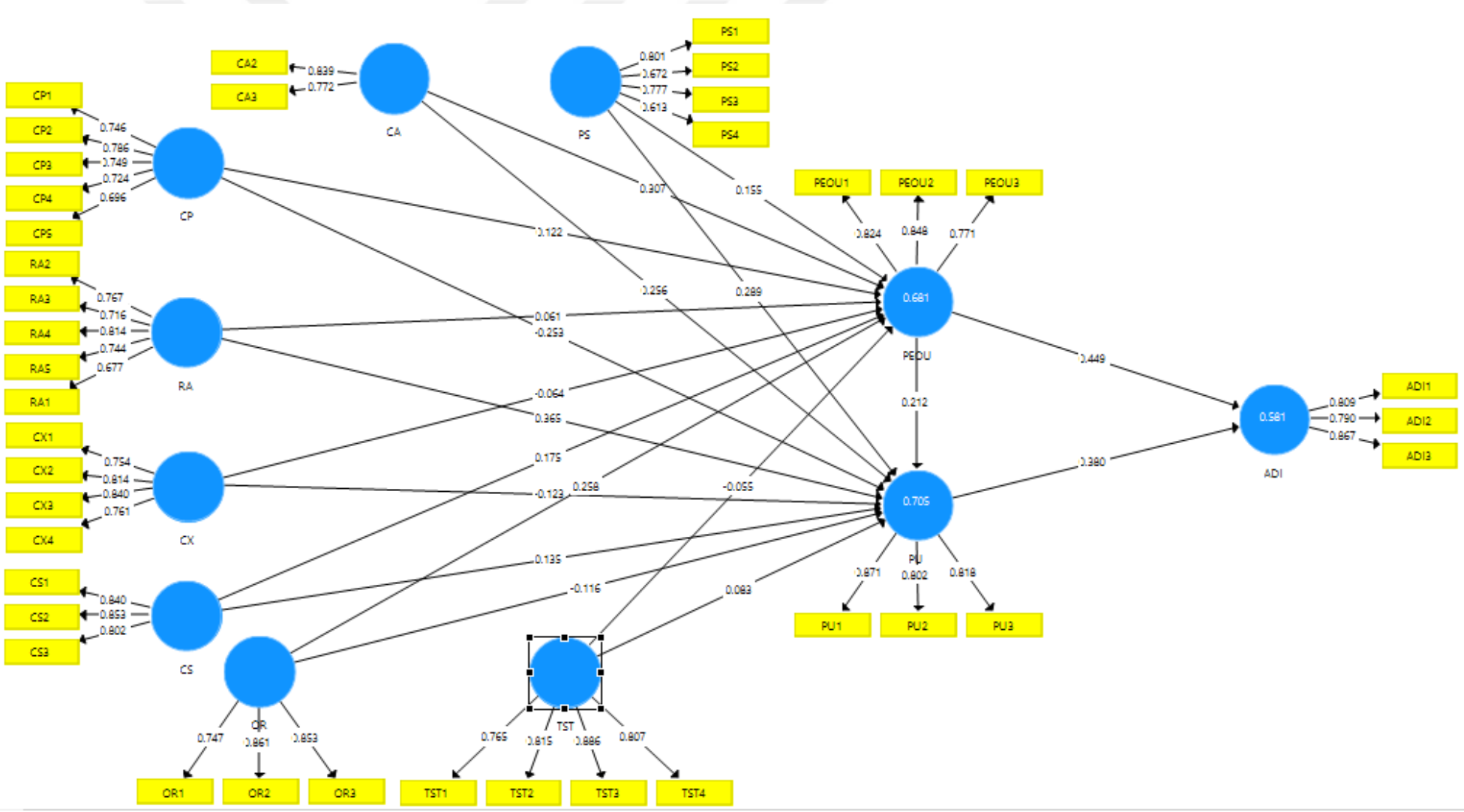


**Figure 17**: Path Analysis of the Model

## 3.5 Testing Group Differences

We will use an independent t-test to assess differences between two groups (already implemented or not) and the t-test of (Region) in our sample, and ANOVA to see if there is a significant difference between numerous groups (e.g., Department or Firm size).

Regarding the t-independent test using the variable (already implemented or not), it turns out that there is a significant difference with the items showed in the Table 10, where competitive advantage and perceived ease of use have p values 0.000 and 0.022 respectively. Whereas, for the region t-test, it turns out that there is no significant difference between the study variables and whether it is multinational company or local company. The same results have been found for the ANOVA Analysis of the firm Size with no significant difference, regarding the department factor, a significant difference has been detected for the variable complexity with a result of 0.019.

**Table 8:** Group Differences Table

| **Implementation** | | **N** | **Mean** | **SD** | **t** | **p** |
|---|---|---|---|---|---|---|
| **Competitive Advantage** | No | 166 | 2.13 | 0.743 | 2.752 | 0.000 |
| | Yes | 230 | 1.92 | 0.761 | | |
| **Perceived Ease of Use** | No | 166 | 2.31 | 0.873 | 2.179 | 0.022 |
| | Yes | 230 | 2.12 | 0.853 | | |
| **Department** | | N | Mean | SD | t | p |
| **Complexity** | Consultant / Vendor ERP | 16 | 3.19 | 0.981 | 2.986 | 0.019 |
| | Export | 33 | 2.06 | 0.788 | | |
| | Finance | 54 | 2.33 | 1.046 | | |
| | IT | 159 | 2.49 | 0.947 | | |
| | Top Management | 134 | 2.56 | 0.922 | | |

# 4. Discussion

This research was conducted in terms of understanding the behavior of adoption intention when using End-To-End ERP Supply chain platforms in the textile retail industry sector. In order to analyze this subject, we used a hybrid model, Technology Acceptance Model TAM / Technological-Organizational-Environmental TOE. The variables of the TAM model have been used as mediating variables between the dependent variable adoption intention and the variables of TOE model, this study tried to determine the role of these models in order to understand the adoption intention of ERP, as there are few studies in this concept, particularly, End-To-End ERP and specifically in the context of textile retail industry sector.

In order to clarify the relationship between the above cited concept, and the effects of the TOE model variables on the mediating variable constructs PU and PEOU, afterwards, the effect of the TAM constructs on the adoption intention, in our conceptual model, hypotheses were tested using the Partial Least Square Path Modeling, the result found in the analysis chapter will be discussed in this section.

## 4.1. The impact of technological variables on Usefulness and Ease of use:

The study identified couple of technological factors such as complexity, compatibility and cost as important variables for affecting End-To-End ERP adoption using perceived ease of use and perceived usefulness as mediating variables. Whereas, relative advantage turns out that has an effect only through perceived usefulness to the adoption intention, the relative advantage proved to be an important variable affecting the adoption intention, where the adoption enhances the efficiency, effectiveness and profitability of an organization, It is also expected and confirmed that timely information for decision-making would be given. Aside from the obvious cost-cutting benefit. In contrast to traditional supply chain ERPs, which treat each area of the business individually, E2E ERP allows the organization to work as a single process, boosting insights and decisions, by providing a transactional view of the business and unified data, these features have been proved as well in previous studies across different digital supply chain tools for instance AI tools in the supply chain (Chatterjee et al, 2021), ERP System Adoption (Rajan & Baral, 2015). Second, as suggested in the hypotheses complexity will have a negative impact on the adoption of

E2E ERP through the perceived usefulness and perceived ease of use these hypotheses have been supported during the analysis. As stated in the previous researches for instance Parveen & Sulaiman (2008) whom claims that system complexity is inversely linked to perceived usefulness and perceived ease of use. This means that if consumers find it difficult to operate a system (E2E ERP in this case), they will consider the system as worthless and incapable of being managed easily, which would affect the adoption intention negatively. The next technological factor assumes that when the ERP implementation is compatible whether with the current infrastructure and the current business operations, it is more likely to adopt a new system as found by Rajan and Baral (2015) This hypothesis turns out to be supported due to the high flexibility and customization that E2E ERP vendors provide, hence, the more the innovation features are considered useful to an organization and they are exploited without any unexpected circumstances with the current IT infrastructure, the more this innovation system is considered compatible. The last variable in the technological factor refers to the cost of the innovation where it is assumed that cost-effective of an innovation can have a positive impact on the adoption, this has been proved as well within the retail industry (Ghobakhloo et al, 2012). The hypothesis found in the analysis supported, according to the findings, retail companies are more inclined to implement digital supply chain E2E ERP if it immediately helps the organization while also being cost-effective and providing high-level service, our case clarified that an end-to-end platform is a platform will make customers' processes more effortless and cost effective.

## 4.2. The impact of organizational variables on Usefulness and Ease of use:

Under organizational Characteristics and factors, organizational readiness has been identified as a significant positive effect on perceived usefulness and perceived ease of use, these results are consistent with previous research (Gangwar et al, 2015), which found that if adequate financial and technical resources are available, implementing an innovative technology would be easy. E2E ERP services are more likely to be used by firms with greater degrees of organizational readiness. As a result, managers and decision makers must prioritize financial and technological resources such as physical infrastructures, tangible resources, and cost-benefit analyses of innovation. The second variable in the context of organizational factors is technical skills and training, this turns out to be not supported hypothesis which is contradictory to previous researches

within the context of digital supply chain tools, technical skills and training in terms of End-To-End ERP platforms in the textile retail industry have not an impact neither on the perceived usefulness and perceived ease of use directly, or the adoption intention indirectly, it seems that the ERP vendors in the textile sector made it understandable and easy tools for their customers, thus, these latter have not find a reason to hire experts and skillful employees to manage their ERP which is a way to reduce costs.

## 4.3. The impact of Environmental variables on Usefulness and Ease of use:

Competitive advantage and vendor support were among the environmental factors. The data analysis results confirmed the proposed assumptions for competitive advantage and vendor support.

In support of Hypotheses H7a and H7b, competitive advantage has a considerable influence on perceived usefulness and perceived ease of use. Earlier research (Wang et al., 2015) found that the usage of AI tools involves the use of machine learning, deep learning, and natural language processing within the ERP, which would offer a competitive edge to the business compared to those that do not employ these. In the context of E2E ERP AI tools will lead an organization to have a real time insight, this will be helpful to make the right decisions at the best moment, and as a result, a profitable inventory management will be established.

The results of the study also find a partner support as an important factor positively influencing the adoption intention of E2E ERP, in previous research (Rajan & Baral, 2015) a concept named vendor lock-in where organizations may not be able to change their vendors in case of service dissatisfaction scenario, this issue has been found as a negative influence on the adoption of innovation, whereas, in our study, the retail industry sector seems are not facing this kind of situation, this could be due to the customization offered by the ERP vendors. Data availability and security and being supportive providing technical support, all of these factors are having a positive impact on the perceived ease of use and perceived usefulness, this is supported by the fact that, in order to work efficiently, an invention requires the participation and coordination of business partners (Gangwar et al, 2015).

### 4.4. Perceived Ease of Use and Perceived Usefulness and adoption Intention:

According to the literature at the TAM level and as indicated by (Davis, 1989), the perceived usefulness of a new technology is determined by its perceived ease of use. According to the TAM (Davis, 1989), these two variables, perceived usefulness and perceived ease of use, are the main drivers of an individual's attitude toward the use of a particular technology, and hence the determinants of its intention to use and actual use behavior. In our case of E2E ERP, perceived ease of use, as predicted, has a large influence on perceived usefulness. When utilizing an E2E ERP, the utility of the ERP is evaluated favorably when the effort required for its use is low. These factors lead to evaluate the service usefulness positively when the ERP has a user-friendly platform and does not have any hurdles that might prevent users from readily using the service (e.g., expertise in Design and AI tools).

According to our findings, perceived usefulness and perceived ease of use have a substantial impact on whether or not retail industry sector users would use E2E ERP. Thus, the model suggests that the perceived usefulness and perceived ease of use of the technology are key determinants of an individual's intention to use this technology. This means that textile companies need to be convinced of the usefulness of E2E ERP systems in terms of how it can improve their business processes and how easy it is to use and integrate with existing systems.

# 5. Conclusion

This research was conducted to analyze the impact of integrating the TAM’s construct and the TOE constructs in order to determine the adoption on the retail textile industry intention to use an End-To-End ERP. The main purpose of the study is to integrate both these models while using TAM's constructs as mediating variables between TOE's constructs in order to determine the importance of company's intention to adopt the E2E ERP and how it affects directly the continuance intention and overall, the relationship.

The integration of both TAM and TAM models have been realized in several research previously in order to investigate about digital supply chain innovation, this research is conducted in the context of End-To-End supply chain ERP platforms, specifically, in the retail textile industry sector, as we have mentioned before that due to a lack of frameworks and adoption guidelines for

supply chain digitization, the integration of these digitalized platforms and their acceptance in the supply chain world have faced several difficulties, subsequently, it is quite important to understand these challenges, Thus, we considered it necessary to conduct this study and understand the factors influencing the adoption of these E2E platforms, A number of hypotheses were cited after an examination of the literature. In order to examine the link between our constructs, a survey was created and disseminated to supply chain stakeholders in the textile retail business sector. The survey was prepared in both English and French utilizing suitable literature and the back translation approach. The hypotheses cited have been tested using the partial least squares path modeling. Consequently, our findings showed that the variables of TOE model act as important constructs through the mediating constructs Perceived usefulness and Perceived ease of use in order to emphasize on the adoption intention of the End-To-End Supply chain ERP Platforms, the external variables of the TAM are divided on technological factors which are relative advantage, complexity, compatibility and perceived cost, whereas for organizational factors, we hypothesized that both organizational readiness and technical skills and training are influencing the adoption, however, it has been seen that technical skills and training do not have an influence on the adoption of E2E ERP. From the side of environmental factors competitive advantage and partner support have an indirect effect as well to the adoption intention through the mediating variables. The mediating variables in turn, they have a significance effect between them where the perceived ease of use has a positive influence on the perceived usefulness once the utilization of the innovative technology demands minimal exertion and boasts a user-friendly interface that eliminates any obstacles that may impede the ease of use for the individuals utilizing the service, for instance (Lack of easiness or requirements for expertise in AI tools).

By applying the integrated model TOE-TAM we have been able to determine the factors influencing customer acceptance and adoption of end-to-end ERP platforms in supply chain management in the retail textile sector, as suggested by Bryan and Zuva (2021). In overall, the integration of the two models has the potential to furnish organizations with a more exhaustive comprehension of the various elements that play a role in the acceptance and execution of novel technologies. Furthermore, it may aid organizations in identifying and tackling any potential obstacles or difficulties that may occur during the adoption and implementation process, thus enabling them to make informed decisions.

Few studies have looked at the adoption of Industry 4.0 technologies; as a result, this study is seen as unique, particularly because it considers E2E ERP in the retail textile industry. Finally, this research may also lead to new questions for future research in the field of ERP adoption in textile retail industry.

## 5.1. Managerial Implications:

The managerial implications of this research include providing textile retailers a better understanding of the factors that affect the adoption of E2E ERP systems and possibly assisting managers in textile retail organizations in identifying and addressing any barriers or challenges that may arise during the adoption and implementation process. This will allow managers to make decisions about the use of E2E ERP systems in their organizations with greater knowledge. These research findings may allow as well E2E ERP vendors to enhance their product and its development, by doing so, vendors may be able to innovate products that are more likely to be adopted and better satisfy the demands of textile retailers. Creating targeted marketing and sales strategies that place an emphasis on the crucial elements that are significant to textile retailers may be helpful. This can assist vendors in creating better service and support plans to assist textile retailers in overcoming the obstacles and challenges mentioned in the literature.

## 5.2. Research Limitations:

In our research, there have been several limitations that potentially impeded the research on the factors that influence the adoption of E2E ERP systems in textile retail organizations, which prevented its completion earlier such as the sample size which has been completed with high difficulty, which could be too small to be representative of the population of textile retail organizations. This could limit the generalizability of the findings to the wider population of textile retail organizations. From another side, this study focuses on a specific type of technology (E2E ERP) and a specific industry (textile retail) and may not be generalizable to other types of technology and industries. Moreover, the present study has not taken into account other constructs in the conceptual framework model, and this is due to the complexity and length of the survey that would be, which may have resulted in a low response rate.

## 5.3. Future Research Perspectives:

To expand the conceptual model and comprehend the behavior of the textile sector throughout the technology adoption stage, more study is required. Future study might employ the alternative model's variables, to which we could add new ones like political dominance, the trialability of an invention, IT policy and regulations from an organizational perspective, and perceived enjoyment and user satisfaction from a personal perspective. This research paradigm may be used in a number of areas that have not yet been researched, such as the industrial or healthcare equipment industries.

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# APPENDIX 1. Questionnaire in English

## EVALUATION OF END-TO-END SUPPLY CHAIN ERP PLATFORMS ADOPTION: TEXTILE RETAIL INDUSTRY EXAMPLE

# End-to-End Supply chain

The process of end-to-end visibility, abbreviated (E2E), is defined as visibility across supply chain management processes, from product conception and raw material sourcing to the point where finished goods are delivered to consumers, all while collecting data and insights using AI tools.

The life cycle of a product in a supply chain is managed by implementing an E2E ERP platform. For example, Li & Fung Group has developed a customized end-to-end supply chain ERP platform for global brands which are working in the retail textile industry, this E2E ERP specializes in textile and performs all operations in the supply chain, starting with product design and including all aspects of compliance, factory sourcing, manufacturing control, and logistics. It enables tracking of goods during delivery and customs operations, local transportation, distribution, inventory management and sales to end consumers with the goal of providing data-driven insights. thereafter, there will be duplication of the product life cycle.

Based on this survey, we will clarify the customer adoption intention of the end-to-end platform in the textile retail industry sector, and we will determine the factors influencing customer acceptance and adoption of these platforms.

**Company Information (Part 1 out of 5)**

Please read all questions carefully and answer them honestly. There are no right or wrong answers. Your participation is anonymous and absolute confidentiality is guaranteed when processing the data.

My organization has already implemented an End-to-End ERP platform

- ○ Yes
- ○ No

How many people does your firm currently employ

- ○ 1-50
- ○ 51-100
- ○ 101-500
- ○ 501-1000
- ○ 1001-5000
- ○ 5001-10000
- ○ >10000

Which department of the organization, you are using the ERP from

- ○ IT
- ○ Top Management
- ○ Finance
- ○ 3rd Party Consultancy/ERP Vendor

- Other:

Which year has been your organization established

Which Region does the company exercise

- Multinational
- Other:

**Technological Factors (Part 2 out of 5)**

the adoption of digital supply chains may be negatively impacted if customers and other parties involved in the operations within the retail industries believe that implementing such technology is complicated, ineffective, or costly.

Please indicate to what extent you agree or disagree with each of the following statements from 1 (strongly agree) to 5 (strongly disagree).

| | Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| Using E2E ERP, we can access information in real time from any place | | | | | |
| Using E2E ERP, we can access all shared resources on the platform ex: 3D sampling tools. | | | | | |
| Using E2E ERP, Order accuracy has been improved. | | | | | |
| Using E2E ERP, we are able to track and consult all the product information from its idea till the delivery to the final consumer | | | | | |
| Using E2E ERP Digital textile tools 3D sampling and Fashion walk we are able to reduce Production and Delivery Time | | | | | |
| The use of E2E ERP with the existing legacy system is a difficult task for our organization. | | | | | |
| The AI tools of E2E Supply chain ERP are not easy to use | | | | | |
| E2E ERP Supply Chain is complex to use. | | | | | |
| Using E2E ERP functionalities simultaneously takes too much of my time | | | | | |
| The adoption of ERP is compatible with the firm's IT infrastructure | | | | | |
| The integration of E2E ERP Platforms in our IT architecture will be manageable | | | | | |
| The ERP system matches our current processing procedure | | | | | |
| It is mandatory to follow to the vendor's product philosophy once an E2E ERP has been adopted. | | | | | |
| The changes caused by the adoption of ERP are compatible with the existing operating practices | | | | | |
| We believe using E2E ERP is cost effective for our organization | | | | | |
| With E2E ERP adoption, we expect to see cost-savings effect. | | | | | |
| E2E ERP systems based on AI tools reduce product cost | | | | | |

**Organizational Factors (Part 3 out of 5)**

An institution cannot successfully adopt new supply
chain technologies without the direct assistance of executive management providing the resources and recruiting the experts, who
would communicate the vision of the adopted digitization and its integration
to strategic objectives across different departments.

| | Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| We have all the human resources dedicated in order to use the E2E ERP | | | | | |
| We have sufficient technological resources to implement E2E ERP | | | | | |
| We have the ability to pay for the end-to-end platforms' implementation, upgrades and ongoing costs | | | | | |
| We have experts in the AI domain in our organization. | | | | | |
| My company provided me complete training in using E2E ERP. | | | | | |
| My level of understanding was substantially improved after going through the training program on E2E ERP | | | | | |
| The training gave us confidence in use of E2E ERP | | | | | |

**Environmental Factors (Part 4 out of 5)**

An organization cannot be environmentally qualified if it is not able to manage its external relationships and its competitive advantage accurately, where the organizations' primary goal is to satisfy the requirements of their clients.

| | Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| In order to be competitive in the market, it is highly important to implement E2E ERP | | | | | |
| We are aware that many firms are moving towards AI based ERP | | | | | |
| Our vendor provides technical assistance for readiness of E2E ERP | | | | | |
| We ensure that our vendors implement strong access and identity management to prevent unauthorized access. | | | | | |
| We ensure that our vendors protect the privacy of sensitive data. | | | | | |
| It would be very difficult to change a platform vendor due to legal and contractual restrictions | | | | | |

**Usefulness and Ease of use of E2E ERP (Part 5 out of 5)**

| | Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| Using E2E ERP will allow us to improve supply chain performance | | | | | |
| We can achieve our objectives quicker and accurately using E2E ERP | | | | | |
| Using E2E ERP enhances the Supply Chain cost optimization | | | | | |
| It is an easy-to-use E2E ERP and the AI tools included | | | | | |
| The process and structure of E2E ERP are understandable | | | | | |
| We agree that all the related employees can quickly learn the usage of AI-based technology. | | | | | |
| We strongly intend to use End-to-End ERP in our company. | | | | | |
| Our organization intends to adopt End-to-End ERP in the near future | | | | | |
| Overall, we think that using End-to-End ERP services is advantageous. | | | | | |

# APPENDIX 2. Questionnaire in French

## ÉVALUATION DE L'ADOPTION DES PLATEFORMES ERP DE LA CHAÎNE D'APPROVISIONNEMENT DE BOUT EN BOUT : EXEMPLE DE L'INDUSTRIE DE LA VENTE AU DÉTAIL TEXTILE

CherParticipant,

Merci de participer à mes recherches et de m'accompagner dans la réalisation de ma thèse sur l'attitude des entreprises du secteur de l'industrie textile face à l'adoption de plateformes ERP (E2E) de bout en bout. Cette recherche vise à analyser et à déterminer les facteurs influençant l'acceptation et l'adoption par les clients des plateformes de bout en bout dans la gestion de la chaîne d'approvisionnement. (Temps d'estimation 10min)

**End-to-End Supply chain**

Le processus de visibilité de bout en bout, abrégé (E2E), est défini comme la visibilité sur les processus de gestion de la chaîne d'approvisionnement, de la conception du produit et de l'approvisionnement en matières premières jusqu'au point où les produits finis sont livrés aux consommateurs, tout en collectant des données et des informations à l'aide Outils d'IA.

Le cycle de vie d'un produit dans une chaîne d'approvisionnement est géré en mettant en œuvre une plate-forme E2E ERP. Par exemple, Li & Fung Group a développé une plate-forme ERP de chaîne d'approvisionnement personnalisée de bout en bout pour les marques mondiales qui travaillent dans l'industrie textile de détail, cet ERP E2E est spécialisé dans le textile et effectue toutes les opérations de la chaîne d'approvisionnement, en commençant par le produit conception et incluant tous les aspects de la conformité, de l'approvisionnement en usine, du contrôle de la fabrication et de la logistique. Il permet le suivi des marchandises pendant les opérations de livraison et de douane, le transport local, la distribution, la gestion des stocks et les ventes aux consommateurs finaux dans le but de fournir des informations basées sur les données. Par la suite, il y aura duplication du cycle de vie du produit.

Sur la base de ce questionnaire, nous clarifierons l'intention d'adoption par les clients de la plate-forme de bout en bout dans le secteur de l'industrie de la vente au détail de textiles, et nous déterminerons les facteurs influençant l'acceptation et l'adoption de ces plates-formes par les clients.

**Informations sur l'entreprise (Partie 1 sur 5)**

Veuillez lire attentivement toutes les questions et y répondre honnêtement. Il n'y a pas de bonnes ou de mauvaises réponses. Votre participation est anonyme et une confidentialité absolue est garantie lors du traitement des données.

Mon organisation a déjà mis en place une plateforme ERP End-to-End

- Oui
- Non

Combien de personnes votre entreprise emploie-t-elle actuellement

- 1-50
- 51-100
- 101-500
- 501-1000

- 1001-5000
- 5001-10000
- >10000

De quel département de l'organisation vous utilisez l'ERP

- IT
- Top Management
- Finance
- Consultant /fournisseur ERP
- Other:

En quelle année votre organisation a-t-elle été créée

- Multinationale
- Other:

**Facteurs technologiques (Partie 2 sur 5)**

L'adoption des chaînes d'approvisionnement numériques peut être affectée négativement si les clients et les autres parties impliquées dans les opérations au sein des industries de la vente au détail estiment que la mise en œuvre de cette technologie est compliquée, inefficace ou coûteuse.

Veuillez indiquer dans quelle mesure vous êtes d'accord ou en désaccord avec chacune des affirmations suivantes de 1 (fortement d'accord) à 5 (fortement en désaccord).

| | Tout à fait d'accord | D'accord | Ni d'accord, ni pas d'accord | Pas d'accord | Pas du tout d'accord |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| En utilisant E2E ERP, nous pouvons accéder aux informations en temps réel depuis n'importe quel endroit | | | | | |
| En utilisant E2E ERP, nous pouvons accéder à toutes les ressources partagées sur la plate-forme, par exemple : les outils d'échantillonnage 3D. | | | | | |
| En utilisant E2E ERP, la précision des commandes a été améliorée. | | | | | |
| En utilisant E2E ERP, nous sommes en mesure de suivre et de consulter toutes les informations sur le produit depuis son idée jusqu'à la livraison au consommateur final | | | | | |
| En utilisant les outils textiles digitales E2E ERP, l'échantillonnage 3D et le défilé de mode, nous sommes en mesure de réduire les coûts de production et les délais de livraison. | | | | | |
| L'utilisation d'E2E ERP avec le système existant est une tâche difficile pour notre organisation. | | | | | |
| Les outils d'IA de l'ERP de la chaîne d'approvisionnement E2E ne sont pas faciles à utiliser | | | | | |
| E2E ERP Supply Chain est complexe à utiliser. | | | | | |
| L'utilisation simultanée des fonctionnalités E2E ERP me prend trop de temps | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| L’adoption de l’ERP est compatible avec l’infrastructure IT de l’entreprise | | | | | |
| L'intégration des plates-formes E2E ERP dans notre architecture IT sera gérable | | | | | |
| Le système ERP correspond à notre procédure de traitement actuelle | | | | | |
| Il est obligatoire de suivre la philosophie produit du fournisseur une fois qu'un ERP E2E a été adopté. | | | | | |
| Les changements induits par l'adoption de l'ERP sont compatibles avec les pratiques d'exploitation existantes | | | | | |
| Nous pensons que l'utilisation d'E2E ERP est rentable pour notre organisation | | | | | |
| Avec l'adoption d'E2E ERP, nous nous attendons à voir un effet de réduction des coûts. | | | | | |
| Les systèmes ERP E2E basés sur des outils d'IA réduisent le coût des produits | | | | | |

**Facteurs organisationnels (Partie 3 sur 5)**

Une institution ne peut adopter avec succès de nouvelles technologies de chaîne d'approvisionnement sans l'aide directe de la direction générale fournissant les ressources et recrutant les experts, qui communiqueraient la vision de la digitalisation adoptée et son intégration aux objectifs stratégiques dans différents départements.

| | Tout à fait d'accord | D'accord | Ni d'accord, ni pas d'accord | Pas d'accord | Pas du tout d'accord |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| Nous avons toutes les ressources humaines dédiées afin d'utiliser l'ERP E2E | | | | | |
| Nous avons suffisamment de ressources technologiques pour mettre en œuvre E2E ERP | | | | | |
| Nous avons la capacité de payer la mise en œuvre, les mises à niveau et les coûts permanents des plates-formes E2E | | | | | |
| Nous avons des experts dans le domaine de l'IA dans notre organisation. | | | | | |
| Mon entreprise m'a fourni une formation complète à l'utilisation de l'ERP E2E. | | | | | |
| Mon niveau de compréhension s'est considérablement amélioré après avoir suivi le programme de formation sur E2E ERP | | | | | |
| La formation nous a donné confiance dans l'utilisation d'E2E ERP | | | | | |

**Facteurs environnementaux (Partie 4 sur 5)**

Une organisation ne peut être qualifiée environnementale si elle n'est pas en mesure de gérer avec précision ses relations externes et son avantage concurrentiel, l'objectif premier de l'organisation étant de satisfaire les exigences de ses clients.

| | Tout à fait d'accord | D'accord | Ni d'accord, ni pas d'accord | Pas d'accord | Pas du tout d'accord |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| Afin d'être compétitif sur le marché, il est très important de mettre en œuvre E2E ERP | | | | | |
| Nous sommes conscients que de nombreuses entreprises se tournent vers un ERP basé sur l'IA | | | | | |
| Notre fournisseur fournit une assistance technique pour la préparation de l'ERP E2E | | | | | |
| Nous veillons à ce que nos fournisseurs mettent en œuvre une gestion solide des accès et des identités pour empêcher tout accès non autorisé. | | | | | |
| Nous veillons à ce que nos fournisseurs protègent la confidentialité des données sensibles. | | | | | |
| Il serait très difficile de changer de fournisseur de plate-forme en raison de restrictions légales et contractuelles. | | | | | |

**Adoption des ERP (Partie 5 sur 5)**

| | Tout à fait d'accord | D'accord | Ni d'accord, ni pas d'accord | Pas d'accord | Pas du tout d'accord |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| L'utilisation d'E2E ERP nous permettra d'améliorer les performances de la chaîne d'approvisionnement | | | | | |
| Nous pouvons atteindre nos objectifs plus rapidement et avec précision en utilisant E2E ERP | | | | | |
| L'utilisation d'E2E ERP améliore l'optimisation des coûts de la chaîne d'approvisionnement | | | | | |
| Il s'agit d'un ERP E2E facile à utiliser et des outils d'IA inclus | | | | | |
| Le processus et la structure d'E2E ERP sont compréhensibles | | | | | |
| Nous convenons que tous les employés concernés peuvent apprendre rapidement l'utilisation de la technologie basée sur l'IA. | | | | | |
| Nous avons fortement l'intention d'utiliser l'ERP de bout en bout dans notre entreprise. | | | | | |
| Notre organisation a l'intention d'adopter l'ERP de bout en bout dans un proche avenir | | | | | |
| Dans l'ensemble, nous pensons que l'utilisation des services ERP de bout en bout est avantageuse. | | | | | |

The End