

SMART FIT SYSTEM: MERGING AUGMENTED REALITY WITH SMART TAILORING AND INSTANT DELIVERY

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Abstract

Due to persistent long wait periods, inconsistent manual measuring, and repeated in-person visits, traditional tailoring services have proven to be ineffective. These problems are certainly problematic from the customer's perspective, but they also have a negative impact on the income potential of home-based often female tailors who are unable to access a wider market. This research attempts to offer a digital solution for transforming the tailoring process using Business Process Re-engineering (BPR) and simulation modeling. The Tailor Digitalize System (TDS) provides an interface where customers can book, submit measurement forms and track jobs online. At the same time, it empowers home-based tailors by providing an organized digital venue that helps them to promote their services and manage their work seamlessly. The simulation models developed in AnyLogic proved to noticeably improve the efficiency of service delivery, satisfaction of customers, and accessibility to tailors when compared to the traditional process. In other aspects, the use of Generative AI incorporates new functionalities such as the application of Augmented Reality (AR) for automatic body measurement, and virtual fitting sessions, boosting user engagement and precision. This research illustrates the impact of technology in this context bridging the gap between traditional craftsmanship and modern digital convenience.

INTRODUCTION

One of an important tool is re-engineering the business process which could be made to redesign the current business practices components into another more efficient form. In the world of competition, re-engineering the business process is the key factor for organisational success or performance (Almansour, Yaser & Aladwan, Atef & Alsaudi, Musa. (2016). The Simulation and modeling allows to achieve the solution of the analyzed problem by performing simulations until the results are satisfying (Kikolski, 2017; Bohács, Kovács, Rinkács, 2016; Elomari, Svensson, Olsson, 2018). The capacity of simulation in facilitating 'what if' analysis has a rich soil for utilization in

re-engineering and business process analysis. Business process changes are usually risky and their consequences hard to rectify once put in place. The ability to test their effects off-line is invaluable to business managers, and this is one of the core strengths of simulation techniques. (Hlupic, Vlatka & de Vreede, Gert-Jan & Orsoni, Alessandra. (2006). Tailoring is a key aspect of human existence for many centuries, having developed with fashion and clothing demands changing over time. From hand-stitched fabrics in ancient times to today's professional tailoring services, Tailoring has always helped people in providing ready-made garments as per their choice. Traditionally, customers go to the tailor's shop,

explain their choice of design, give measurements, and many times return for fittings, then go and get the final garment. Although this process provides a personalized service, there are also several issues that affect not only customers but also tailors. The main problems faced by customers long waits at tailor shops, which often lead to frustration Wrong measurements taken in haste, due to which the clothes do not fit properly the need for multiple alterations, which leads to further delays Frequent visits to shops in urban areas are time-consuming and annoying As a result, people often rely on ready-made clothes, which are neither according to their size nor according to their taste. On the other hand, domestic tailors, especially women, also face several difficulties despite being the best tailors, they find it difficult to get customers. They rely mostly on personal recommendations, which limits their revenue and customer base. They don't have a structured platform to showcase their skills, forcing them to earn less. Although the digital revolution has changed many industries, the world of tailoring is still largely based on traditional methods. Today's customers want simple and time-saving solutions, while skilled tailors need better opportunities. to expand their services. But due to the lack of a specific digital platform, both the customer and the tailor have to rely on old, ineffective methods. The aim of this research to address all these issues, this research proposes a digital tailoring application that will modernize the tailoring experience. The platform will allow customers to book tailor-made services online, get measurements done at home, and place orders easily. The home delivery facility will save customers from going to the tailor shop. On the other hand, housewives will get a digital marketplace, through which they will be able to increase their income by reaching more customers. Through the integration of technology, this solution will not only make it easier for customers It will also provide better economic opportunities for self-employed tailors.

Literature Review:

Business process re-engineering (BPR) is becoming an increasingly important tool due to rapid technology and digital transformation. Organizations all over the world rely on BPR to stay competitive, improve customer satisfaction, and streamline operations. With the help of automation, artificial intelligence, and cloud-based solutions, businesses can re-engineer old workflows and streamline them with modern digital practices. Businesses played a key role during and after the coronavirus pandemic to help them shift their work to remote

locations, streamline operations, and sustain efficiency in uncertain times. (Al-Mashari, M., & Zairi, M. (2020)). For example, Amazon successfully implemented business process re-engineering after 2015 by replacing robots and artificial intelligence for manual warehousing operations. This change increased speed, reduced errors, and decreased costs advantages that were especially relevant during the coronavirus pandemic's increase in internet sales. Simulation and modeling are very important tools for decision-making, testing, and improving systems without actual risk. With the rise of technology and complex systems, industries like healthcare, transportation, and manufacturing are now using simulation to test ideas before applying them in real life. This saves time, cost, and helps in predicting future results more accurately. (Banks, J., Carson, J. S., Nelson,

B. L., & Nicol, D. M. (2013)). For example, Airlines such as Boeing use simulations and modeling to test new aircraft designs. Before building the actual aircraft, they develop digital 3D models and run simulations to test the behaviour of the aircraft in different weather and flight conditions. This way they identify and fix problems early on, saving millions of dollars and ensuring a safe flight. The integration of Business Process Engineering (BPE) with simulation and modeling has proven to significantly improve decision-making and process redesign. Simulation allows businesses to virtually test and analyze re-engineered processes before actual implementation, reducing risks and costs. The combination helps organizations identify bottlenecks, improve efficiency, and increase success rates of business changes. As digital transformation has accelerated during this period especially after coronavirus-19 the use of simulation tools in BPE has become more imperative. (Jahangirian et al., 2010). For example, A country like Pakistan's Lahore General Hospital was having issues like crowding, waiting times and under-strengthening of resources (e. g. at the moment during the COVID-19 pandemic). When they did however use Business Process Reengineering (BPR) and Simulation Tools they were able to develop new workflows, such as the triage of patients, the allocation of beds and movement of staff. The simulations allowed them to test such changes in a controlled setting, identify bottlenecks and optimize resource utilization.

Table 2.1 Comparative analysis of Previous Research Studies

Title	Year of Publication	Problem	Solution	BPE/Simulation
[1]	4, December 2012	Traditional design workflows in architecture and engineering are prone to interoperability issues, tool-dependent integration difficulties and limited flexibility when linking design and analysis applications. The existing models and top-down approaches limit customization of the existing workflows, while increasing their durability in real-time collaboration.	a bottom-up, user-driven and process-oriented framework is proposed, that combines cloud computing, flexible data sharing and graphical workflow modeling, offering the possibility to create custom digital workflows, enhancing collaboration and efficiency in design and analysis tasks.	Business Process Engineering
[2]	21-22 October 2014	Practical tailor-made clothing involving the traditional method of manual measurements and fittings is inherently inaccurate, time consuming and inconvenient. The lack of digital integration leading to difficulty in offering mass customization with desired fit.	In this study, we explore 3D digital technologies for virtual fitting in terms of body scanning and virtual try-on tools. The research findings show that such technologies allow for accurate measurements, customizing, and improving the tailoring performance through efficient garment fitting.	Business Process Engineering

[3]	Year 2016	As consumers increasingly demand a more user-friendly experience on their mobile devices, the traditional online shopping experience via web-based websites is being reduced. Mobile app-based shopping presents its own challenges, including connectivity issues, storage limitations, security risks and minimal user retention.	Retailers should consider a balanced strategy that incorporates both mobile apps and mobile-friendly websites to maximize flexibility, security and convenience for customers. Businesses should consider enhancing app engagement, offering seamless payment methods and optimizing mobile experiences for consumer retention.	Business Process Engineering
[4]	September, 2018	Manual tailoring services have inefficiencies as the process is mostly manual, not easily accessible and	With smart e-tailoring framework, coupled with mobile apps, e-tailoring can simplify the	Business Process Engineering

		bound to reach a limited market for tailors working from home. Customers will face inconvenience of the visits to the shop, inaccurate measurements and inadequate staffing, while tailors won't get access to digital platform to spread their reach and	whole process by providing virtual design options, online measurement and automated order processing. The solution increases customer convenience and offers tailors a platform to reach a wider market and grow their business.	
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		grow their business.		
[5]	Year,2018	Traditional tailoring companies operate on manual processes that make the order management, customer interaction and service fulfillment processes slow and inefficient. Home-based tailors face challenges when expanding their business due to limited digital presence and access to market.	Smart Tailor Architecture provides a unified digital platform that connects tailors, designers and customers using mobile and web applications for better service efficiency, order automation and market reach by using smart applications and digital workflows.	Business Process Engineering
[6]	17 August, 2022	The fashion industry has significant CO2 emissions and waste in the environment and therefore environmental concerns. There's not enough integrated	Practice sustainable manufacturing processes using 3D printing and digital tools. Encourage wider use of blockchain technology to enhance supply chain	Business Process Engineering

		knowledge in terms of IoT, AI and blockchain for the fashion industry.	transparency and security.	
[7]	27 April, 2023	The COVID-19 pandemic negatively affected the luxury fashion industry as consumers were left unprepared due to lockdowns, falling wages, and restrictions on travel. This forced companies like Burberry to step up their game to overcome geographical and operational barriers and focus on digital transformation.	Burberry successfully went digital by building its own websites, using AI for customer insights, as well as engaging customers through social media platforms, to help them conquer geographical limitations and promote themselves in the luxury market.	Business Process Engineering.

[8]	27 May,2023	Traditional tailoring services require customers to visit tailor shops physically for measurements and order tracking, which is time-consuming and inefficient. Tailors also struggle with record-keeping and customer management due to manual processes.	The proposed Virlor Tailoring Management System automates the tailoring process by allowing customers to submit measurements online, track order progress, and receive notifications. This system also helps tailors manage records, improve service efficiency, and expand their business digitally.	Business Process Engineering
[9]	13 january, 2024	According to the research there's a gap between the in-store shopping	The study explores Virtual Try-On (VTO) technology as a	Business Process Engineering.

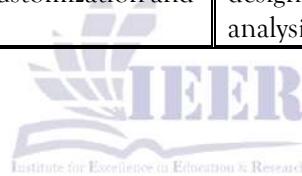
		experience and the limitations of online shopping; consumers have trouble trying on products, which decreases their confidence in buying the product, increases returns, and negatively impacts retail profitability.	bridge between the physical and online shopping environment, helping consumers build confidence in buying and eliminating returns. Retailers should leverage VTO with their omnichannel strategies to deliver better, more engaging shopping experiences.	
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[10]	February 28, 2024	The traditional tailors in locality are not familiar with the creation of e-catalogs and online marketing. Especially because of the construction of the Semarang-Demak toll road, they have difficulty in broadcasting traditional advertisements to the public.	The solution is for tailors to learn how to create digital catalogs and market their businesses on the internet to leverage their business. Tailors will learn to design more attractive and eco-friendly clothes using digital tools and thus increase sales.	Business Process Engineering.
[11]	April-2024	2024Customers find traditional tailoring unsatisfactory, as there is heavy manual burden attached to the process - customers have to visit tailor shops for measuring and checking their orders, tailors are difficult to reach out to their	With the arrival of the Tailor at Your Doorstep project, an AI-powered online tailoring tool is developed incorporating personalized recommendations, body modifications and efficient order tracking (involving	Business Process Engineering

		customers, and order management is a difficult task.	electronic status messages).	
[12]	August 3, 2024	Augmented reality (AR) for e-commerce, especially online fashion retail is heavily underused as technology is not highly developed and consumers are not very confident about how effectively it can be used in online shopping. Many buyers are subject to mistrust due to inaccurate product imagery and fit recommendations.	By integrating advanced AR applications, brands and retailers can leverage it to benefit online shopping by providing immersive try-on experiences, improving product imagery, boosting confidence among consumers, as well as creating customized e-commerce experiences and ultimately drive sales.	Business Process Engineering

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[13]	Year 2024	<p>Today, traditionally designed design workflows in architecture and engineering are plagued by interoperability issues, rigid integration of design and analysis tools and lack of flexibility in the linking of design and analysis applications. Existing techniques are model-based and top-down that limit customization and</p>	<p>This paper proposes a bottom-up, user-controlled and process-oriented framework that combines cloud computing, flexible data sharing and visualization-based workflow modeling. The proposed framework allows designers to design custom digital workflows which can improve collaboration and efficiency in design and analysis tasks.</p>	Business Process Engineering
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		real-time collaboration.		
[14]	Year2024	Experimental work shows that traditional textile artists and designers can not effectively incorporate digital technology into their techniques due to lack of research and guidelines. This fact limits their ability to innovate, create sustainable designs and satisfy increasing consumer demands.	The research proposes an approach to this problem that takes advantage of techniques that are traditionally used in textiles, such as CAD software, 3D modeling and digital printing, and helps designers achieve better creativity, efficiency and sustainability in contemporary textile and clothing design.	Business Process Engineering
[15]	7 February 2025	Industry 4.0 in the textile and fashion industry lacks full implementation of sustainability principles with high environmental impact, partly due to lack of availability of implementation and infrastructural problems.	The adoption of Industry 4.0 technologies such as artificial intelligence (AI), Internet of things (IoT), blockchain, and CAD-CAM would be needed with greater speed in order to realise the digital transformation. For sustainability and digitalisation to take off successfully it is important to link research institutions, policy makers and industry.	Business Process Engineering

Hence, the majority of previous research deals with digital tools to fashion, virtual fitting using 3D technology, augmented reality of online fashion retail, and smart tailoring frameworks to solve problems such as inaccurate measurement, manual tailoring process and improving customer experience by AI-based simulation and modeling. Another gap arises in the paper because the problem of local tailoring in home country, which is the lack of market access in such an area is mainly focusing on the traditional methods whereas the solution which can be implemented in this domain may not be well understood by local tailors. Most existing studies focus on a virtual platform or online retail but fail to provide a high-quality solution for the local tailor with very little digital knowledge. The Tailor Digitalize System (TDS) solves this gap by offering an end-user oriented platform that can be used to: Book a tailoring service online Provide a digital marketplace for home based tailors to reach more customers Eliminate the need to visit the tailor's place of work. Provide a digital way of handling orders, measurements, and delivery. During this paper we are going to include both the BPE (Business Process Engineering) and simulation to automate the traditional tailoring process. Just because we are taking a natural action of automating the traditional tailoring process doesn't mean that we should fall into BPE because when we are practicing that process, then there should be some improvements or optimizations so that the process is efficient. We will demonstrate the impact of our approach for the purpose of demonstrating the effectiveness of our system by a simulation model in AnyLogic. To show how the whole process of tailoring should work now and how the new system should work now, we will create a simulation model with AnyLogic.

Methodology:

Methodological (theoretical) examination of the methods used in a research field. A way to give systematic explanation of the research problem with reasonable usage of various steps (K, Dr. (2022)). The research began with identification and analysis of the major challenges related to traditional tailoring process. Tailoring is uniquely personalized and creative process with importance of being highly connected to digital technology. But tailoring is still not using modern digital system to cater to the fast pace lifestyle of customers/tailors in local and home-based environment. Customers and tailors will have to depend on old mechanical system which does not meet up to need of a rapidly changing life style in today's era. To understand the challenges and their relevance of a tailoring process, first to identify some repeated problems and also use qualitative observation. Meanwhile, from the customer's viewpoint, customer's complaint of a long waiting time in shop to have garment custom made, inaccurate measurement by manual multiple visits by customer in shop and length of time before garment completed was not reported that far. On the other hand home-based tailors, especially women face the issues of not having market access to market, lack of digital presence, reliance on word of mouth recommendation, lack of systematic order management/customer data management. To validate these problems and make sure they are widespread, to create a questionnaire. The questionnaire was designed in such a way as to gather all relevant details about customer experiences, problems, and willingness to adopt digital solutions.



TAILOR DIGITALIZE SHOP

In today's modern age, everyone requires timely clothing for various events, leading to a high rush at tailors, causing problems for both customers and tailors, such as long wait times, inaccurate measurements, and issues with managing data manually. We aim to create a digital system that will address these issues and streamline the entire process in a simple and efficient manner.

NAME _____

DEPARTMENT _____

Questionaries

How many times you visit the tailor shop? <input type="radio"/> 1 times <input type="radio"/> 3 times <input type="radio"/> 2 times <input type="radio"/> 4 times	Have you ever gone back after feeling frustrated? <input type="radio"/> Yes, I have gone back after feeling frustrated. <input type="radio"/> Yes, but only after some time had passed. <input type="radio"/> No, I have never gone back after feeling frustrated. <input type="radio"/> No, I prefer to find a new tailor when I'm frustrated.
Does visiting the tailor consume your time? <input type="radio"/> Always <input type="radio"/> Occasionally <input type="radio"/> Sometimes <input type="radio"/> Never	What difficulties do Customers face when managing tailoring work manually? <input type="radio"/> Long waiting times. <input type="radio"/> Incorrect measurements. <input type="radio"/> Both. <input type="radio"/> No Problem.
Did you experience any problems when you had to visit the tailor frequently? <input type="radio"/> Always <input type="radio"/> Occasionally <input type="radio"/> Sometimes <input type="radio"/> Never	How many times your dress's measurement is not accurate? <input type="radio"/> Always <input type="radio"/> Once <input type="radio"/> Sometimes <input type="radio"/> Never
How long does it take at a tailor shop? <input type="radio"/> 10mins <input type="radio"/> 20mins <input type="radio"/> 15mins <input type="radio"/> 30mins	Would you like to prefer to use digitalize system as a solution over these problems? <input type="radio"/> Yes <input type="radio"/> Maybe <input type="radio"/> Always <input type="radio"/> Never
Do you feel frustrated when you to wait in long queues to meet your tailor? <input type="radio"/> Always <input type="radio"/> Occasionally <input type="radio"/> Sometimes <input type="radio"/> Never	Would you like the convenience of having a dress pick-up and drop-off service at home? <input type="radio"/> Yes <input type="radio"/> Maybe <input type="radio"/> Not Really <input type="radio"/> Never

THANKU FOR YOUR TIME AND FEEDBACK

Figure 3.1 Questionaries

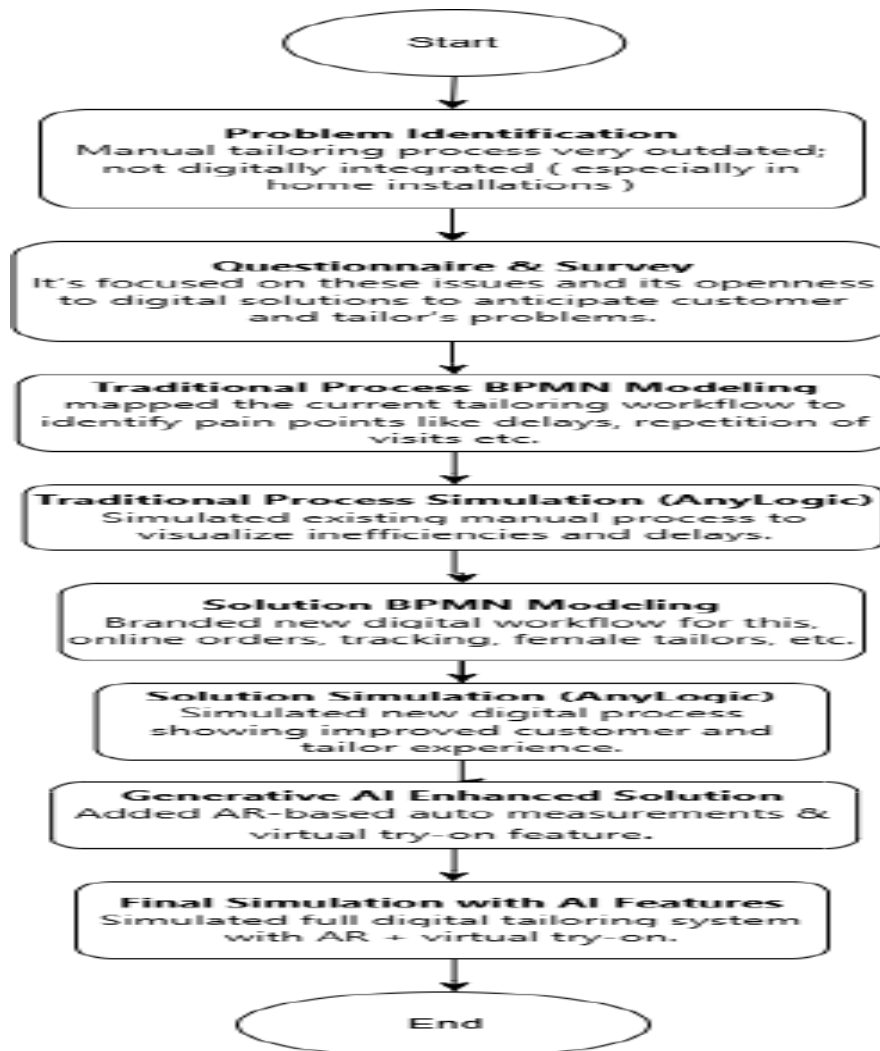
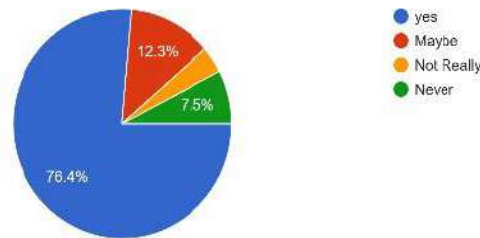


Figure 3.2 Methodology of the research

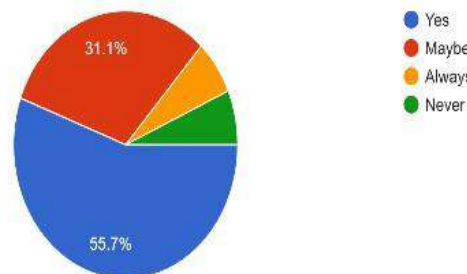
The questions covered: frequency of tailor visits problems in the manual tailoring awareness of digital tailoring solutions satisfaction with current tailoring practices an online survey was conducted after completing the questionnaire to provide more real-life information to support the early problem analysis. This was conducted among tailors and customers from different urban and semi-urban areas. This was undertaken as an attempt to provide more evidence about the challenges that were identified in the preliminary phase of the problem analysis. The results showed that a majority of respondents faced the problems mentioned in the pre-analysis questionnaire. Customers were dissatisfied with the delay and errors in fitting as well as the inconvenience of physical visits. At the same time many tailors stated that the challenge of attracting clients and

operational management is still difficult due to the lack of digital tools. The data given in the survey, which confirmed the fact that the problem exists, was indeed widespread and urgent. It also highlighted how much of the stakeholders were willing to change to a more modern solution, as long as it was readily accessible and user-friendly. So, based on the problem identification and conducted results of survey, the need for Business Process Reengineering (BPR) is defined. For this purpose, a Tailor Digitalize System (TDS) is proposed to replace traditional tailoring processes with a structured digital platform. Through simulation, the improvement in workflow will be visualized, system efficiency will be assessed, and the business operation optimization will be evaluated.

Would you like the convenience of having a dress pick-up and drop-off service at home?
106 responses



Would you like to prefer to use digitalize system as a solution over these problems?
106 responses



After the identification of the problem and carrying out a customer survey, the traditional tailoring process was modelled in BPMN (Business Process Model and Notation) to obtain a structured insight into the current workflow. This diagram provided an overview of each step of a customer's journey from the start

point (customer) until final finish and suggested some major pain points in the process. These included; poor logistics thanks to overcrowding at tailor shops, frustration with the long waiting time, lack of organizational system for style preferences, measurements, and order update and also face several difficulties despite being the best

Women tailors, they find it difficult to get customers. In addition, the BPMN model showed inefficiencies (e. g. repeated visits in person, lack

of real-time communication and manual handling of customer requests).

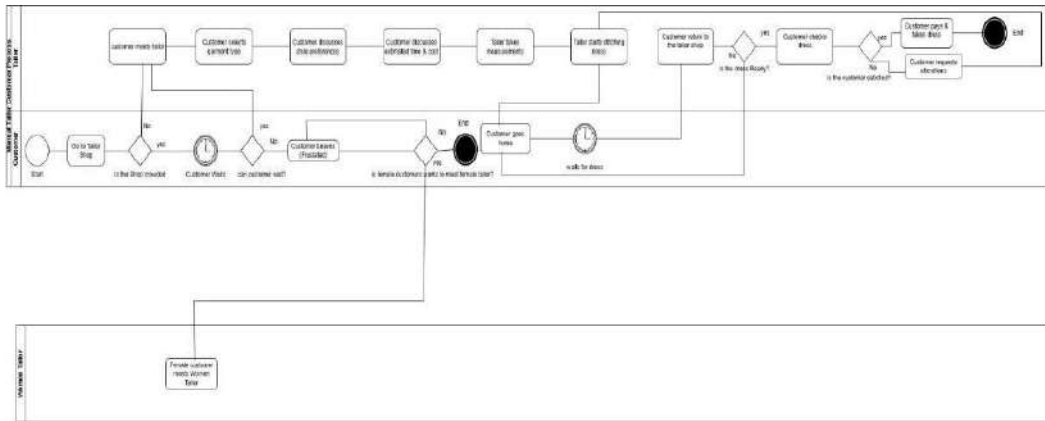


Figure 3.3 Problem BPMN

After BPMN modelling of the traditional tailoring process we then need to develop a simulation model in AnyLogic which will simulate the current, manual tailoring process and provide insight into the performance of the

conversion to digital. The simulation will recreate realistic scenarios from the real world, such as customer waiting time, order delays and repeated visits to the shop, in order to give a taste of the current level of inefficiencies.

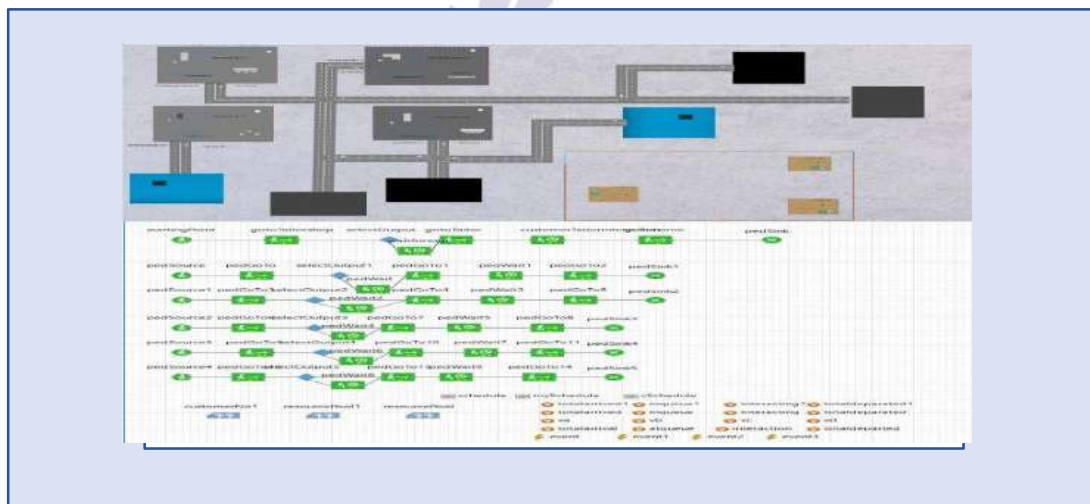


Figure 3.4: Problem Simulation

The inefficiencies identified in the process have been resolved with the development of a digital tailoring system in which the entire ordering process from selecting a style and measurement to selecting a tailor and keeping track of the orders can be done online. Style selection, measurements submission, tailor selection and order tracking is all carried out via a

user-friendly interface. The digital solution eliminates the need for repeat visits to a tailor showroom while reducing the waiting time and also providing easier access to female tailors, particularly for women customers. The BPMN diagram shows the optimized workflow, showing the advantages of electronic transformation.

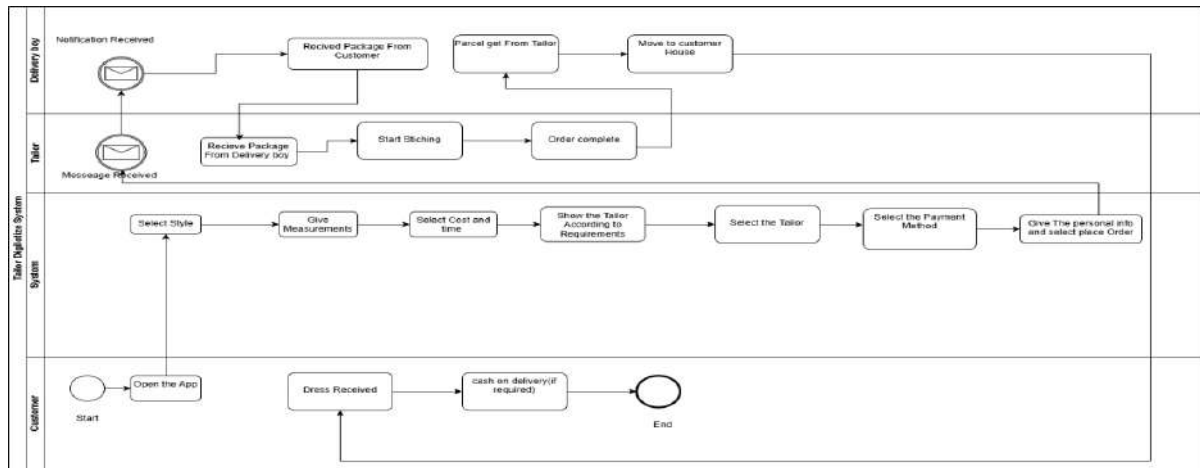


Figure 3.5:Solution BPMN

At the same time, we developed a simulation model to visualize the Tailor Digitalize System through AnyLogic, as well as providing insight into how the workflow would look like after the inefficiency had been resolved. With the help of our simulation, how would the customer order process be performed – from placing the order to the home-based tailor taking measurements, then

tracking the order and finally delivering the fabric from the home-based tailor to its customer – be done? It is clear from this work that the new system empowers the home-based tailors by allowing them digital access to their customers and eliminates the traditional problems in the organization.

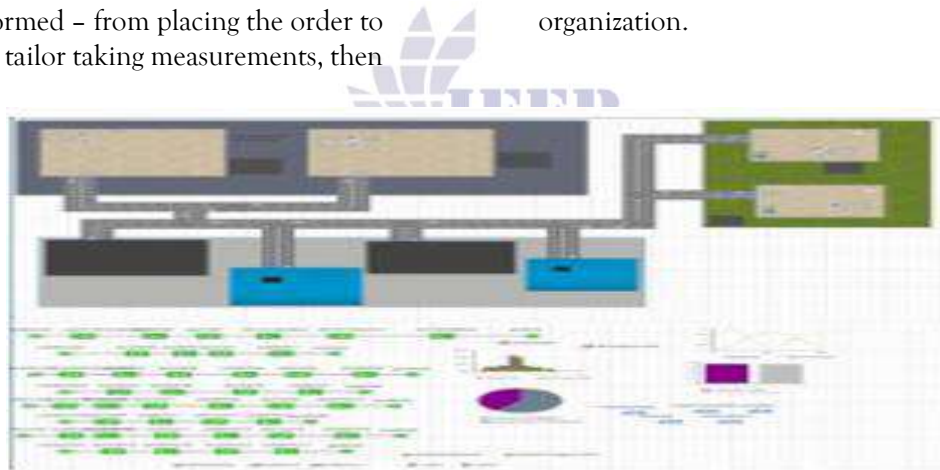


Figure 3.6:Solution Simulation

After, we went ahead and used Generative AI to move forward with solving the problem. The solution the Generative AI generated had two additional features that were not part of the existing design. First, it suggested a use of Augmented Reality (AR) for measurements (the customer would stand in front of their camera while the system takes accurate body

measurements automatically). Second, we wanted a virtual try-on feature where customers could see how their desired style would look on them before placing an order. To visualize and fully understand the new workflow, we created BPMN and simulation Model to identify each step of the better digital tailoring process.

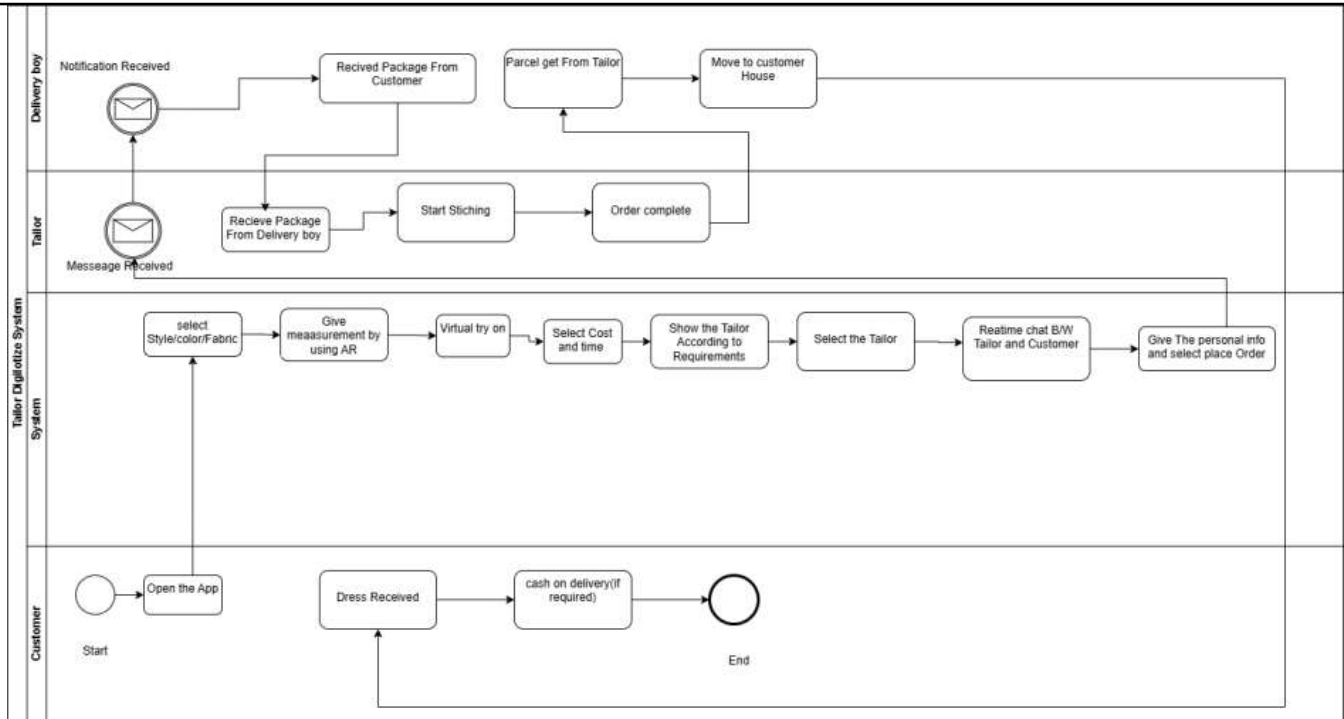


Figure 3.7: BPMN of AI Model

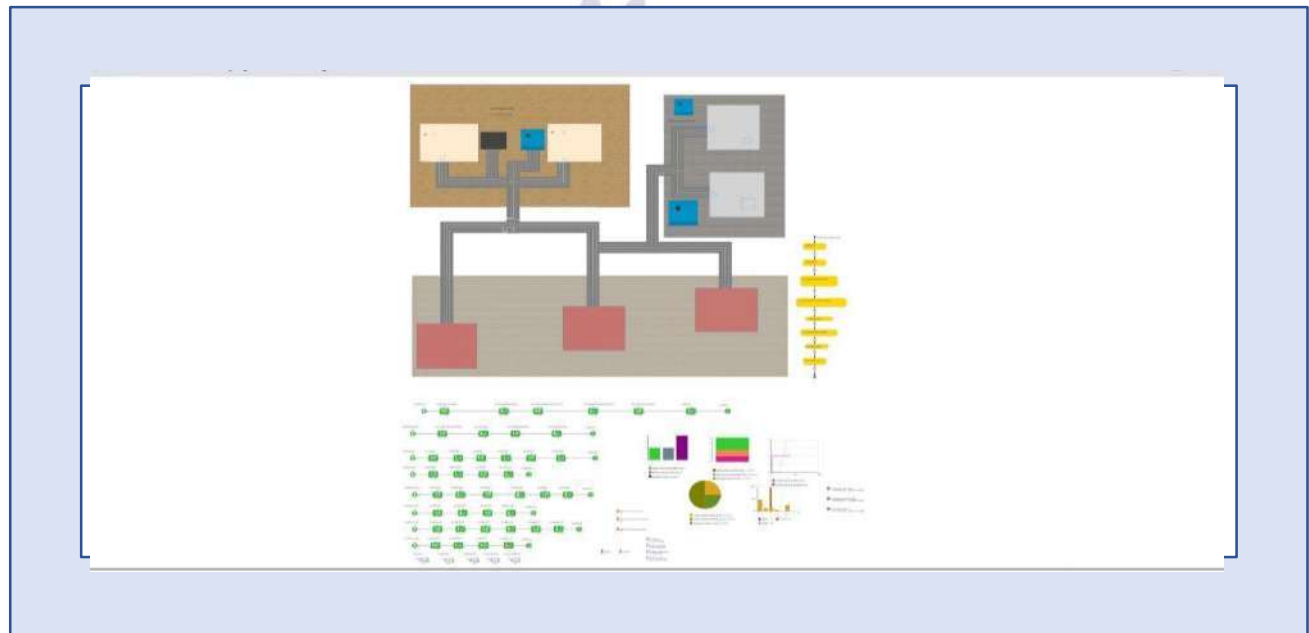


Figure 3.8:AI Simulation Model

Results and discussion:

In order to verify the issues pinpointed in the conventional tailoring approach while determining the necessity for a digital shift, a survey consisting of 2000 customers and tailors

from urban and semi-urban settings was conducted. The survey revealed that 85 percent (1700 people) of the respondents supported the initiative to digitize the

tailoring system, noting decreased waiting times, accuracy in measurements, and efficiency in processes as substantial benefits. Moreover, 80 percent (1600 people) specifically pointed out the

usefulness of a delivery service stating how convenient it would be to have tailored clothes delivered to their homes without the need to visit the tailor’s shop multiple times.

Table 4.1: Survey Result

Survey Statement	Survey Responses	Number of People (out of 2000)	Percentage (%)
Support for digitizing the tailoring system	Yes	1700	85%
	No	300	15%
As delivery service is part of the tailoring system, it should be included as part of the digitized tailoring system	Yes	1600	80%
	No	400	20%

The simulation model illustrated how the traditional tailoring process is inefficient in meeting customers’ needs. It showed that 700 out of 1500 customers visiting tailor shops get so frustrated with unacceptably long waiting periods, that they leave without getting any services rendered. Only 50 of these customers go to women tailors who work from home. Out of the remaining 800 customers, 400 are able to get the services they want. The other 300 users, however need to be served, but unfortunately in this case have to... This bottleneck situation presents a very clear case of quantitative approach to optimization through digitization of the system.

The digital tailoring simulation showed considerable improvement on the system’s overall efficiency. From the application, 1500 users placed orders, out of which 1460 were successfully matched with tailors according to their preferred styles, budgets, and locations. A total of 40 users who were not able to find a suitable match could not be served because their options were too limited. Users were only spending on average 7 minutes from the beginning of the ordering process to the matched-tailor session making bespoke tailoring far more accessible than the conventional systems.

Table 4.2: Traditional Model Analysis

Process Step	Counting People
Tailor shops were open for visits	1500
Walked out in frustration and didn't get served	700
Of them, went to the home-based tailors	50
Were able to get the service done	400
Still in queue	300
Time in process	30 mints

Table 4.3: Digitolize Model Analysis

Process Step	Number of People
App based users ordering dresses/orders	1500
Matched with Suitable Tailors: Success.	1460
Tailor not found.	40
Average time in process	5 minutes

The Generative AI helped in developing the simulation model which showed improved results. It showed that 1500 clients ordered through the digital application. 1480 clients were successfully paired with tailors of their selected styles, budgets, and services. Only 20 users were unable to find a match with the available tailors

at that time due to some constraints. The other clients were processed in just 5 minutes. It is clear that finishing this process with so many clients per day is due to the improvements made by AI, as many users are reporting augmented satisfaction on almost all measures of speed and ease of use.

Table 4.4: AI_Model Analysis

Process Step	Number of People
Users ordering through the application	1500
Matched with appropriate tailors	1480
Did Not Match	20
Time spent on the task	7 minutes

It can be seen from the outcomes that the digital tailoring system simulation model enhanced process efficiency remarkably by minimizing waiting times to a mere 5 minutes per order. In contrast, the AI-based model, though slightly slower with an average of 7 minutes per task, demonstrated even higher

efficiency in customer-tailor matching with higher satisfaction rates. Thus, it can be said that even though the AI-aided solution takes a bit longer, it is generally more effective and dependable in simplifying the tailoring process.

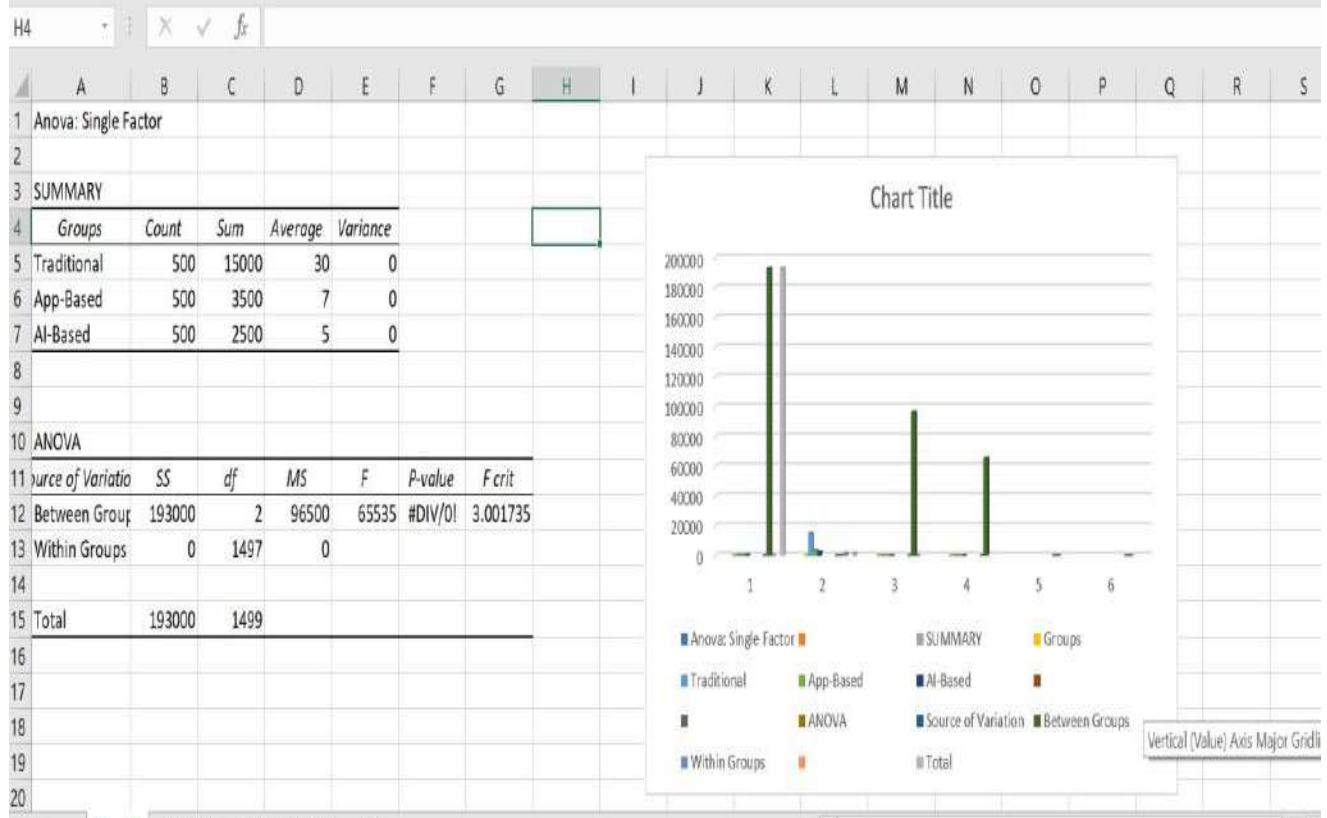


Figure 4.1 Anova Test of three Systems



Figure 4.2 Comparative Table

Aspect	problem Simulation (Traditional System)	Solution Simulation (TSD - Tailor Digitalize System)	Generative AI based Simulation Solution
Purpose	To demonstrate lack of efficiency and difficulties with traditional tailoring process.	To demonstrate the possibilities of a digital customizing system.	To explain advanced AI-powered features for a smarter and interactive system..
Main Features	Manual measurements, In-person visits, Order delays, Customer waiting time.	Online order placement, Home-based measurement entry, Home delivery	Augmented Reality (AR) for auto-measurement, Virtual try-on feature
Tailor Engagement	limited to shop-based interaction.	Home-based tailors can receive and fulfil orders digitally.	Home-based tailors supported by advanced AI tools and digital client previews.

Customer Experience	Time-consuming & inconvenient.	Order Placed through digital App.	Virtually try the outfit, Give the measurement through camera.
Technology Integration	Very limited (relatively traditional manual process)	Basic digital platform	Deep integrations of AI/AR and virtual modeling.
Simulation Objective	Identify bottlenecks, delays, inefficiency	Visualize digital workflow and evaluate performance benefits & ease of access.	Validate AI improvement/immersive features for customers' satisfaction.
Tools Used	Anylogic 8.9.2 Software	Anylogic 8.9.2 Software	Anylogic 8.9.2 Software

Conclusion:

The process digitalization and AI integration within the tailoring industry are highly praiseworthy and their full potentials are positively indicated by the study. The traditional tailoring process, which was mainly relying on manual measurements, customer visits, and considerable order delays, turned out to be an unproductive and a great waste of time for both the customers and the tailors. The Tailor

Digitalize System (TSD) was the new online order placing, digital measurement entering, and home delivery options where all the above-mentioned problems were being resolved and a more customer-friendly and streamlined process was being experienced. The simulation of the redesigned digital system was carried out and showed a significant increase in operational effectiveness, cutting customer waiting time and allowing tailors using home-based setups to be

actively involved in order filling. This move not only increases access but also grants support to economic inclusion through making tailors who are now able to work remotely empowered. Then, the Generative AI-based simulation solution opened up a new field of innovation by using Augmented Reality (AR) in the automatic measurement and virtual fitting capabilities. The AI-powered traits are making a great impact on the end-users by increasing the user experience and personalization aspects and thereby, making the distinction between physical and digital tailoring services less rigorous. To sum up, the advancing transition from manual to digital and AI-powered tailoring systems shows the extent of technology revolutionizing the age-old industries. The future researchers have a lot to gain from the current work to the extent of predictive design recommendations, smart fabric selection and real-time customer feedback systems to ultimately create a completely autonomous smart tailoring ecosystem.

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