

## Executing Quality Management Tools to Enhance Customer's Journey at a Clothes Laundry Firm

*Mohammed Alshahrani*

*Mahmoud Alabdali*

*Wafa Zaid*

*Rola Mohammad*

*Khalid S. M. Husain*

Department of Business Administration, Faculty of Economics and Administration, King Abdulaziz University, Saudi Arabia

[Doi:10.19044/esj.2023.v19n28p89](https://doi.org/10.19044/esj.2023.v19n28p89)

Submitted: 19 July 2023

Accepted: 06 October 2023

Published: 31 October 2023

Copyright 2023 Author(s)

Under Creative Commons CC-BY 4.0

OPEN ACCESS

*Cite As:*

Alshahrani M., Alabdali M., Zaid W., Mohammad R. & Husain K.S.M. (2023). *Executing Quality Management Tools to Enhance Customer's Journey at a Clothes Laundry Firm*. European Scientific Journal, ESJ, 19 (28), 89. <https://doi.org/10.19044/esj.2023.v19n28p89>

### Abstract

**Purpose:** This paper focuses on assessing and enhancing the customer's journey at a laundry company in Saudi Arabia. This begins from the moment the customer arrives at the car park, including the process of receiving the services and subsequently making payment. **Design, Methodology, Approach:** A mixed-method approach was employed and qualitative data were gathered from focus group interviews and individual interviews. Quantitative data were gathered via the survey. Quality Management Tools were used to develop the action plan and offer conclusions and recommendations that would enhance the customer's journey and improve satisfaction. **Findings:** Issues relating to service quality are categorized into five types: promotions, human resources, services, detergent products, and facilities. House of Quality represents the highest 15 prioritized solutions. These recommended solutions' relative weights range between 4 to 9%. The use of these tools highlights areas for improvement and the root causes of each issue. The voice of the customer and the voice of the employees are key sources to obtain valuable input. This research proffers step-by-step practical guideline for service organizations on how they can apply the quality management tools in their business, which will help them identify issues and

continue improving. Its implications to academia merge the ServQual theory and QM in customer services and satisfactions. Originality/Value: This study will add value to the literature since there are limited studies employing the seven Quality Management Tools to enhance customer satisfaction and improve their journey. The Saudi laundry market specifically has a dearth of this type of study. The leadership of an organisation in the laundry sector is established through the implementation of tailored quality solutions, the prioritisation of customer satisfaction, and the enhancement of operational efficiency.

---

**Keywords:** Quality Management Tools, Customer Journey, Clothes Laundry Stores, ServQual, Customer Satisfaction, Customer Experience

## **Introduction**

The laundry sector in Saudi Arabia has experienced significant growth due to demographic changes and the increasing demand for dry cleaning, clothes washing, and laundry services. The working female population in Saudi Arabia is expected to continue growing, thus leading to an increase in spending on clothes and cleaning services. The laundry industry has evolved into an indispensable service, with annual revenue yields estimated at \$60.88 billion. The industry's growth is attributed to various sector services, including industrial sectors, as well as social factors such as the increasing number of single-person households and the rapid pace of urbanization.

Globally, the laundry and service industry are estimated to reach \$75.1 billion by 2025, with a CAGR of 4.2%. The leading laundry brand in Saudi Arabia, with over 25 branches in one city, has been operating in this industry since 1982. The subsidiary company started a new model in 2017 with 10 branches in one city. The company plans to expand to other regions and cities and achieve 20 branches by 2025.

Service quality in laundry-care settings is closely linked to customer satisfaction, and businesses can improve service quality to differentiate their offerings and ensure customer satisfaction. High service quality also leads to increased customer loyalty. This is because high service quality generates high customer satisfaction, ultimately leading to customer loyalty.

As the Saudi laundry market faces increased competition, optimizing operational processes is crucial for providing value to customers and meeting consumer expectations. Observing service quality is a critical aspect of service business. It helps identify and close the gap between customers' normative service expectations and their views of service performance. The ServsQual dimensions, consisting of five specific attributes, are an effective tool for measuring service quality.

Reliability is a crucial aspect of service quality, and it evaluates a firm's ability to deliver a promised service accurately and dependably. It refers to a firm's commitment to providing timely and appropriate support to customers, thus ensuring punctuality and commitment. Tangibles, on the other hand, refer to a firm's physical facilities and appearance, which influences its brand image and customer perception. These dimensions include equipment, staff attire, and visual appeal.

Assurance is the staff's knowledge, skills, courtesy, and ability to instill trust and confidence among customers. It involves informing customers and listening to them, regardless of factors such as age, nationality, and educational level. Empathy is the resulting respect and friendliness from personal contact with customers. This requires service providers to establish policies and procedures to strengthen relationships with clients, staff, and other interpersonal relationships. It focuses on offering care or personalized attention to clients, thus demonstrating approachability, sensitivity, and efforts to understand customer needs.

Satisfaction is the state of a process end in which customers subjectively evaluate the perceived benefits drawn from a service. It refers to the cognitive assessment of the extent to which the service delivers, and the level of fulfillment gained from the consumption of a specific service. This research aims to maximize understanding of customers' needs and wants by listening to them and improving the customer journey from the moment they arrive until they obtain what they need. To achieve this objective, the researchers used a mixed-methods approach, including qualitative data collection through focus group interviews and quantitative data collection through surveys. They further employed Quality Management Tools to generate an action plan and formulate decisions and recommendations so as to develop the customer journey and increase satisfaction.

## **Focus Groups**

Concerning the focus groups, the authors organised a virtual meeting with three customers and three representatives from the organisations. The focus group lasted for approximately 60 minutes. The main topic of discussion was the customer expectations regarding the laundry service, which would lead to their satisfaction while covering areas such as promotions, human resources, services, detergent products, and facilities inside the stores.

## **Survey**

### ***Designing the Survey***

The study utilized SERVQUAL dimensions, which was adapted from the work of Parasuraman et al. It was expanded based on data from focus group sessions. The questionnaire was translated into Arabic and sent to academic

colleagues and professionals to assess content and face validity. Subsequently, the questionnaire was forwarded to the project director for feedback, comments, and modification before being disseminated. A pilot test was conducted to assess the questionnaire's reliability and validity. Cronbach's alpha was used to analyze reliability, with values above 0.70 being crucial.

The correlation method was also employed to investigate the validity of the questionnaire. One item was deleted for the empathy dimension due to a non-significant correlation, thus reducing Cronbach's alpha from 0.923 to 0.836 (Table 1). Three items were removed from the additional services dimension due to their insignificant correlations. The mean and standard deviation for each item in the survey indicate that customers are relatively satisfied with the current service quality.

**Table 1.** Measuring the Reliability and Validity of the Questionnaire

Main Factor	Code	Dimension/Question Area	Cronbach's Alpha	Total Correlation
<b>Tangibles</b>	TA1	The company has up-to-date equipment in the branch that I recently visited.	0.873	0.601**
	TA2	In general, the physical facilities in the branch that I recently visited are visually appealing.		0.574**
	TA3	Employees were well-dressed/neat in the branch that I recently visited.		0.642**
	TA4	The facility that I recently visited has a waiting area.		0.650**
	TA5	The waiting time is appropriate and reasonable at the facility that I recently visited.		0.772**
	TA6	There is an adequate and suitable parking space at the facility that I recently visited.		0.559**
	TA7	The air conditioning inside the facility that I recently visited is appropriate and convenient.		0.409*
	TA8	The facility that I recently visited smelled appealing.		0.746**
	TA9	There is appropriate and convenient packaging for clothes when received.		0.832**
<b>Reliability</b>	RE1	The company responds to the customers within the promised time frames.	0.951	0.820**
	RE2	The company is dependable for cleaning services.		0.902**
	RE3	The company is dependable for ironing services.		.905**
	RE4	The company provides cleaning services within the agreed times of service.		0.875**
	RE5	The company provides ironing services within the agreed times of service.		0.901**

Main Factor	Code	Dimension/Question Area	Cronbach's Alpha	Total Correlation
	RE6	The company keeps accurate records about the customer's invoices.		0.846**
	RE7	The services provided on my last visit suited my expectations and needs as a customer.		0.724**
	RE8	Every time that I visit the company's facilities, I receive the same quality service.		0.588**
	RE9	The company provides a special service of washing each customer's clothing separately.		0.808**
Responsiveness	RS1	The company informs customers exactly when the service will be performed.	0.942	0.859**
	RS2	Employees are always ready and willing to help customers.		0.799**
	RS3	Employees welcome and respond to special requirements from the client such as increasing starch folding or hanging clothes.		0.865**
	RS4	Employees respond quickly if something goes wrong to solve the problem, such as missing clothes or wrong pricing for a service provided.		0.882**
Assurance	AS1	The employees are trustworthy.	0.943	0.902**
	AS2	Customers feel safe when dealing with employees.		0.905**
	AS3	The employees are polite.		0.875**
	AS4	Employees respond to customer inquiries with a clear answer.		0.867**
	AS5	Employees advise choosing the appropriate service according to my needs		0.789**
Empathy	EM1	The company gives individualized attention to each customer.	0.923	0.745**
	EM2	The employees give individualized attention to each customer.		0.819**
	EM3	Employees prioritize the needs of the customers.		0.754**
	EM4	The company operates at hours convenient to the customer.		0.819**
	EM5	Employees fully understand the needs of the customer.		0.820**
Additional services	AD1	I wish that the company provided pick up and home delivery.	0.902	0.735**
	AD5	I wish that the company provided cleaning products available for purchase.		0.829**
Satisfaction	SA1	The provided service of laundry and ironing are excellent and professional.	0.953	0.820**
	SA2	I consider this service my first choice.		0.754**

Main Factor	Code	Dimension/Question Area	Cronbach's Alpha	Total Correlation
	SA3	My overall experience with the provided service satisfies me.		0.819**
	SA4	I recommend this service to people who seek my advice.		0.820**
	SA5	The price of the ironing service is appropriate and suitable for the quality of the service provided.		0.902**
	SA6	The price of the laundry service is appropriate and suitable for the quality of the service provided.		0.905**
	SA7	I am completely satisfied with the company's complaints system.		0.875**
	SA8	I am completely satisfied with the compensation system in the event of loss or damage to clothes.		0.901**

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).






### ***Distributing the Survey***

The study population comprised of customers who use dry cleaning services. The survey was distributed electronically via the online link and a printed QR code was pasted in all the laundry's branches. The survey used simple random sampling, thus giving each customer the same opportunity to participate in the questionnaire (Fleiss et al., 2013). A total of 131 complete responses were received and used in the subsequent stages.

### **Customer Journey Map**

The Customer Journey Map is a technique for tracking and analysing the customer experience and evaluating the quality of a service or process. The Customer Journey Map is a time-based, linear representation of the main stages that a customer encounters when interacting with a company or service (Mangiaracina & Brugnoli, 1970). Customer experience is primarily a process that starts with a beginning entry point and progresses to an endpoint based on users' intentions, motivations, and goals. This experience flow is separated into key stages using Customer Journey Mapping. Commencing with an analysis of the user's behaviour, specific goals, intentions, touchpoints, tools, and issues are identified in each stage. Furthermore, the emphasis shifts to the connections and dynamics that exist within stages (Mangiaracina & Brugnoli, 1970).

The customer experience, in relation to laundry, is structured into five key stages: visiting the site, the catalogue of services the customer can choose, browsing and/or requesting, receipt of service selection, and the final checkout process with payment (Figure 1).

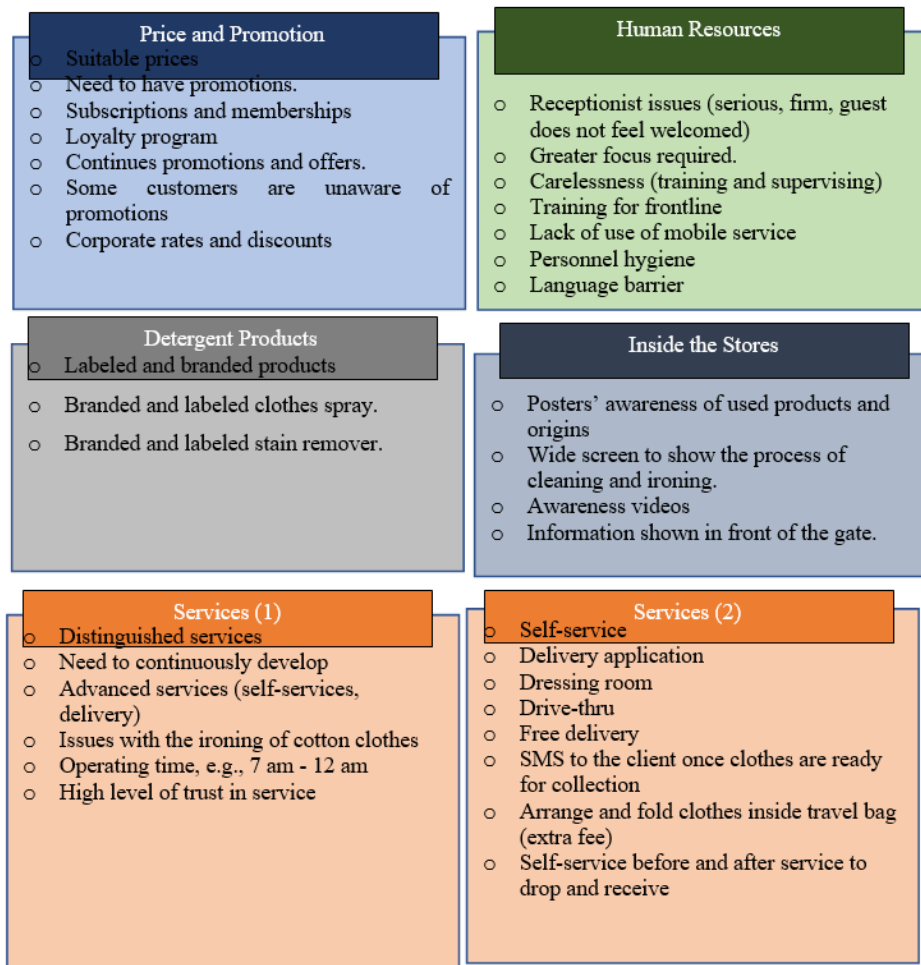
Customer Journey Map						
Stage		Visiting	Requesting	Serving	Receiving	Payment
Responsibility Department	Customer Services					
	HR					
	Operational Service					
	Stock					
	Sales					
	Accounting					
	Top Management					
Customer Feeling						
Overall Rating		3.95	4.03	3.95	4.03	3.97

**Figure 1.** Customer Journey Map.  
 Developed by the authors.

## Quality Management Tools

### *Affinity Diagram*

The affinity diagram is a quality management and planning tool. It is useful in capturing, collecting, categorising, classifying, and grouping ideas into commonly shared concepts (Widjaja & Takahshi, 2016; Awasthi & Chauhan, 2012; Cheng, 2014). This is in addition to brainstorming language phrases. This tool further helps to understand, organise, and recognise trends so as to avoid duplicates. The information categorised in the affinity diagram is a starting point for analysis and inputs with other tools (Carnevalli & Miguel, 2008). From the focus group, the outcomes of interviews and responses to the questionnaire were separated into five groups (Figure 2).

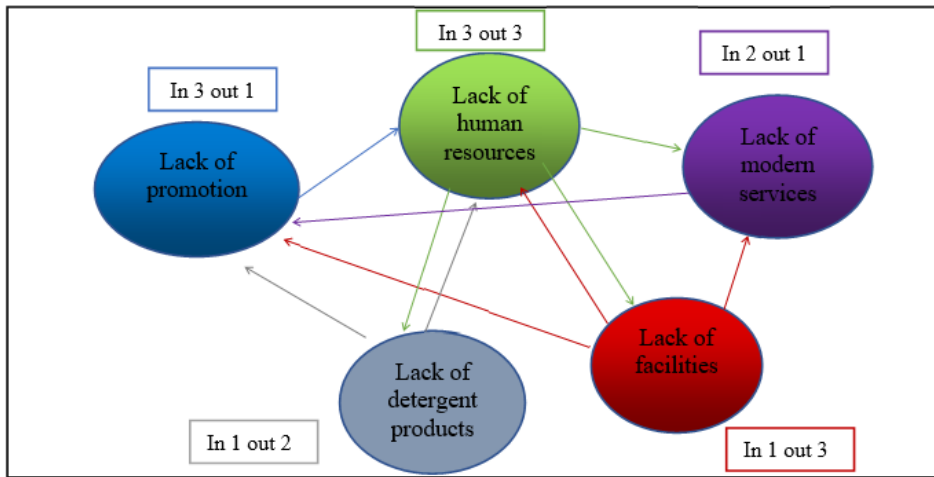


**Figure 2.** Affinity Diagram for Quality of Services Issues (Developed by the Authors)

### ***Interrelationship Diagram***

The relationship diagram, also known as an interrelationship diagram or network diagram, portrays the cause-and-effect relationships that exist between issues. This quality management tool assists the business to understand relationships among different aspects of a complex group of factors that influence problem solving (Marinescu et al., 2010). It begins by drawing the relational connections that appear in the affinity diagram, which requires a highly creative process. The following relationships are obtained from the logical relationship between groups in this study (Figure 3).





**Figure 3.** Interrelationship Diagram (Developed by Authors)

### ***Tree Diagram***

The Tree Diagram, also known as tree analysis, an analytical tree, or a hierarchy diagram, is just one type of mind map (Jones et al., 2001). While a mind map has a central idea surrounded by branches of related ideas, a Tree Diagram has a drawing that is like a tree. This method is exploited to find increasingly greater levels of detail in a complex problem and is beneficial in progressing from generalities to specifics in small steps. The method begins with a single node and branches out to other nodes that represent mutually exclusive decisions or events (Wat et al., 2020).

A Tree Diagram is applied when thoroughly evaluating complex processes to achieve specific objectives in a short period of time. It is also utilised when an organisation must investigate whether the root cause produces a specific effect, i.e., the problem to be solved. Furthermore, it considers the advantages and disadvantages of various potential solutions in successfully implementing them (Marinescu et al., 2010). The Tree Diagram is a unique approach for grouping and clearly documenting ideas (Jones et al., 2001; Marinescu et al., 2010). This diagram begins with its "root," which is the principal or key idea and is subsequently followed by related and derived ideas (supplementary 2)

### ***Process Decision Program Chart (PDPC)***

The process decision program chart (PDPC) is a new management planning tool that systematically identifies what might not be successful in a plan under development. Countermeasures are developed to prevent or offset those problems. The PDPC involves revising the plan to avoid problems or it is prepared with the most effective response when a challenge occurs

(Popescue & Gîrboveanu, 2017). The PDPC is a new management planning tool that systematically identifies what may not succeed in a plan being developed. Attempts are made to minimise or mitigate these issues.

It is worth noting that preventing issues is more straightforward using the PDPC than tackling them after they have already occurred. There are two primary reasons for PDPCs, namely documenting the steps necessary to complete a process and conducting an effective analysis (Popescue & Gîrboveanu, 2017). A rigorous investigation of the process and what might not be successful is the objective of the PDPC.

This project management tool is valuable in the Improve phase of the DMAIC prior to executing a plan. It is beneficial in the analysis following the process mapping to confirm the understanding of the status (Levesque & Walker, 2007). The PDPC, as a six-sigma tool, is not employed in every project because they may not be necessary and require time and work to implement. However, the PDPC is recommended when a new procedure is initiated. The PDPC is also essential when a vast complex project is being undertaken (Mizuno & Bodek, 2020).

The PDPC further provides solutions to the issues listed in the tree diagram. The solutions are illustrated in the green boxes, whereas the potential drawbacks are shown in yellow. In addition, another green box reveals the solution to the drawback (supplementary 3).

### ***Matrix Diagram***

The Matrix Diagram is defined as a new management planning tool used to analyse and display the relationships among data sets. The Matrix Diagram presents the relationship between two, three or four groups of information (ASQ.org). The connection between two, three or four categories of information is explained by the Matrix Diagram (Madigan, 1993). This diagram may also provide information on the relationship between distinct people or metrics, such as the strength of the link. It is possible to create six different-shaped matrices, such as L, T, Y, X, C and roof-shaped. Nevertheless, this depends on how many groups must be compared. The T-shaped matrix diagram was employed in this research (Alwan, 2011). This diagram outlines all the aspects of the PDPC diagram and rates them in terms of value and relationship for each of the initiatives. Accordingly, they are rated based on strong, medium, weak or no relationship, thus allowing the authors to determine which solution are important (Table 2 and supplementary 4).

**Table 2.** Matrix Diagram Symbol Value

Symbol	●	○	▼	
Value	9	3	1	
Relationship	Strong	Medium	Weak	No relationship

### ***Prioritization Matrix***

The Prioritization Matrix is a useful technique for identifying problems that are most important to resolve first. The use of appropriate tools is critical to project success. Gantt and Burndown charts for project management, team communication, and project scheduling are examples of what can be achieved using project management software. When used in conjunction with specified criteria, this matrix is recognised as a Criterion or Priority Matrix. This business analysis tool enables people and project teams to objectively assess possibilities. This allows them to identify the following aspects: Which initiatives are of the utmost importance? Which of these provides the greatest value to the firm? Which has the greatest chance of success?

The Prioritization Matrix can be used by anybody, from individuals to large organisations, for any sort of work or project, regardless of its complexity. When utilised effectively, this approach is a reliable conflict management and resolution strategy that also serves as a more efficient means of choosing projects (Tovar-Perilla et al., 2018). Furthermore, the tables are divided into technical requirements which are listed vertically, along with the importance score and ranking. The overall importance score is at the bottom, which indicates tasks that need to be prioritised for each department or team to work on.

The strategies or technical requirements were prioritised in terms of the score and were assigned to each department based on the action plan listed in the final column (supplementary 5)

### ***Quality Function Deployment***

Quality Function Deployment (QFD) is a Total Quality Management (TQM) tool used to meet customers' needs and expectations systematically. According to Kiran (2017), QFD is a structured approach that defines customer needs and expectations and applies them to establish plans and create products and services that meet these expectations. This approach involves capturing customer needs and requirements using surveys, observation or field reports. Subsequently, the information is summarized as a product planning matrix and is used to translate product requirements and characteristics to satisfy customer needs (Kiran, 2017).

The most significant use of the QFD process in improving the quality of work is translating customer needs and expectations into product and

service specifications (Kiran, 2017). The researchers employed the House of Quality (HOQ), which is the main tool used in QFD. Firstly, the voice of the customer was divided into five categories obtained from the Affinity Diagram with certain adjustments (promotions, human resources, services, detergent products, and facilities). Below these categories, there was a list of 15 requirements collected from customer statements.

The importance of each requirement was identified from 1 to 5. In addition, technical requirements were imported from the PDPC, with a total of 68 solutions. These were reduced to 15 requirements that hold the highest scores. The relationship aspect was brought in from the prioritization matrix tool. The score of each technical requirement was then calculated. The highest score was 260 for self-service machines involving drop-off and pick-up. On the other hand, the lowest score was 5 for partner services such as Uber and Careem, which provide delivery service (supplementary 6 a- b).

The competitive evaluation involved the company under study and two other companies that focus on the same client segments. The company and competitors' services were assessed against customer requirements prior to employing the improvements. The scale for this test was from 0 to 5. The roof was used to identify where technical requirements support (+) or impede (-) one another in the implementation. To summarise, the HOQ utilised management tools to develop and offer the most appropriate solutions for customer needs and to compete with the rivals in the market (Figure 4).

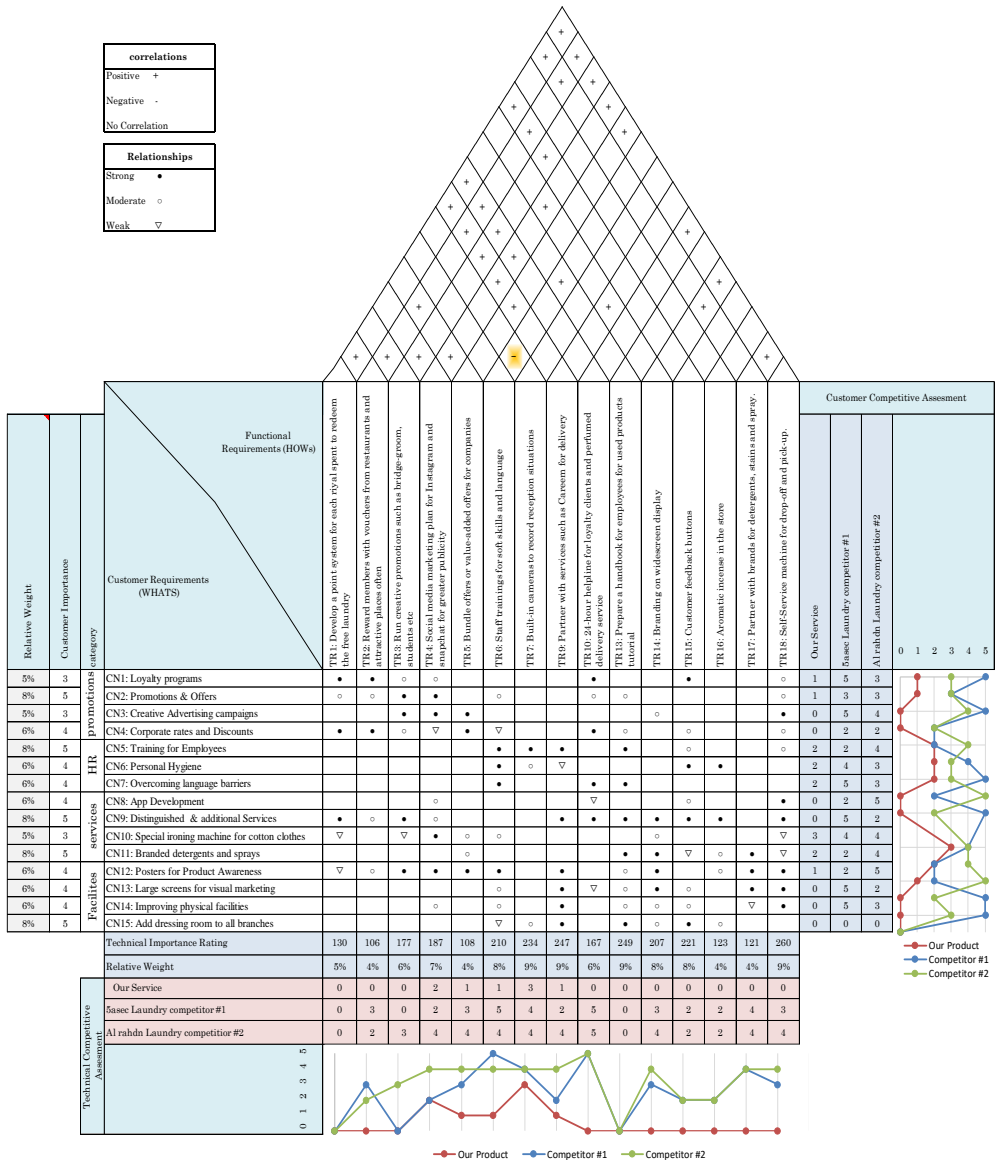


Figure 4. The House of Quality (HOQ)

## Areas for Improvement

### Promotions and Communications

Several views were expressed surrounding promotions. While specific customers requested having promotions, others were not aware that there were promotions. Therefore, it appears that there is a communication gap that requires further improvement and development. The following recommendations have been made:

- Use different communication channels, such as SMS, WhatsApp, and social media.
- Use printouts and flyers and hang them on the clothes.
- Promotional messages at the end of invoices.
- Using screens inside the stores that not only show promotions, but also inform and make customers aware of the entire process to create trust in the service, hygiene, process, care, etc.

### ***Subscriptions, Memberships, and Loyalty Programmes***

The laundry service provider does not have any subscriptions, memberships, or loyalty programmes. Customers are however expected to receive this service. Frequent customers mentioned that, on several occasions (i.e., questionnaires and customers focus group), they expected to have a membership card or loyalty programme where they could be given discounted prices or a points system that could be claimed as free services. Nonetheless, there are some concerns with the implementation of this type of service:

- Systems should be able to track memberships, points programmes, etc.
- Clear programme terms and conditions with a transparent policy.
- Eligible customer and enrolment procedures.
- Table of benefits and advantages.

### ***Staff Issues***

The results of the questionnaires highlight irresponsible and impolite staff who use their phone when customers are present. Customers complained that they did not feel welcomed. Additionally, language may be a barrier between staff and customers whose first language is not Arabic. Thus, to assist with understanding interactions, staff should use simple language without any jargon. The following are suggestions to improve the service and develop a customer-oriented attitude:

- Orientation and awareness sessions should be held frequently to create a customer-oriented approach.
- Develop steps for serving customers in the service industry. This can begin with smiling and receiving their clothes. Typically, four to six steps are employed.
- Ensure that the approach is sustainably applied by using the secret customer/shopper approach and direct feedback from customers, alongside frequent visits from branch managers and supervisors.

### ***Services***

The results confirm a high level of trust in the services provided, which could be a strong competitive advantage that may be built upon and sustained.

Customers are satisfied with regular and traditional services but requested more up-to-date services:

- A greater focus on cotton clothes in the ironing services.
- Drive-through services that would allow customers to access services from their vehicles.
- Customers desire convenient drop-off and pickup of cleaned and ironed clothes, potentially requiring investment in technology and setup for efficient service.
- Customers requested access to clothes machines for self-cleaning services, ensuring privacy and ensuring clothes are cleaned alone without mixing with others' belongings.
- Customers requested having an extra service to wash each customer's clothes separately.
- Customers repeatedly requested delivery services and an APS software application, which could be essential if designed with cost and logistics in mind.
- Some customers receive their clothes and want to wear them immediately. Hence, they suggested having dressing rooms available.
- Customers wanted to be able to take their clothes to be cleaned, give staff a travel bag and subsequently receive the clothes folded inside the bag.
- A few customers suggested extending the service hours and opening early, i.e., 7 am rather than the current open timing of 9 am.

### ***Detergent Products***

Customers have a high level of trust in the services and repeatedly ask if detergent products are available for sale. This area is a new line to diversify the business and potentially reach a new segment of customers who request the following:

- Clothes spray
- Stain remover and freshness
- Detergent products
- Air spray

### **Discussion**

This study set out to assess the importance of enhancing the customer's journey at a laundry company in Saudi Arabia. This begins from when the customer arrives at the laundry store's car park until they are served and pay for the service they have received. This study used the ServQual dimensions (Parasuraman et al., 1988), which is an effective concept used to measure the service quality of Clothes Laundry Services. The survey strategy, focus group

interviews, and questionnaires were utilised to collect data and gain understanding of the services, customers' expectations, needs, and areas for improvement. Seven quality management tools, including the Customer Journey Map, Affinity Diagram, Interrelation Diagram, Tree Diagram, the PDPC, matrix diagram, and QFD were applied in this study to analyse, organise, classify, and categorise collected data, understand relationships, and examine the cause-effect among dimensions.

The Customer Journey Map was used to measure and analyse the customer experience and evaluate the quality of a service or process provided by the firm. The score determined the level of customer satisfaction with specific objectives and intentions, with the touch points in the business. These results suggest that customer satisfaction can add value to the firm and facilitate meeting customer expectations. As a result, the study investigates the effect of SQ on customer satisfaction and develops the SERVQUAL model to investigate the effects of the five dimensions. These results are consistent with the case study conducted by Micheaux and Bosio (2019), which describes how service design methods were used in the development of a course on data-driven marketing. Customer journey mapping, employed as a visual representation of individual interactions with a product, service or brand, explains how an interaction occurs in one moment and how it influences all other moments. Students benefit from a more innovative and creative approach to data-driven marketing by viewing the customer journey from the "data as a service" perspective, which helps improve their attention and motivation.

The Affinity Diagram was used to classify the data extracted and collected from questionnaires, focus groups with employees and customers, and interviews. The finding highlighted service quality issues, which are categorised into five: promotions, human resources, services, detergent products, and facilities. These results are consistent with the study of Lucero (2015). Accordingly, an unstructured qualitative data can be understood through an affinity diagram, which is an appropriate technique for collaborative analysis. Using an affinity diagram in the evaluation process assists with creating and clustering the notes to form a better understanding of the context and subsequently adopting it in practice.

The Interrelationship Diagram supports the firm to understand the relationships among different aspects of a complex group of factors that influence problem solving. These results are consistent with the study undertaken by Kwiecińska (2015), which suggests that the relations diagram not only identifies the association between cause and effect, but also between two or more causes. The elements of the diagram, with the most direct connections, are the starting points for the analysis of further ship safety. In addition, it was used to plan corrective measures and actions that directly



improve shipping safety at sea. Identifying the various causes of fires allows their frequency to be eliminated or reduced in the future.

The Tree Diagram for this project was presented in a series and developed until the desired level of detail was attained. The solutions have been investigated in details. These results are consistent with the study completed by Tanimoto (2008), which investigates a set of issues concerning coordination in collaborative problem solving and design. The study presented a variety of interactive features relating to state-space search trees designed to facilitate such activity. To provide possible solutions to the issue posed in the Tree Diagram, the PDPC was employed to systematically identify what might not work effectively in plans under development.

A set of issues related to coordination in collaborative problem solving and design are explored. Thus, a variety of interactive features for state-space search trees intended to facilitate such activity is presented.

The Matrix Diagram was applied to outline all the aspects of the PDPC diagram. It was rated in terms of value and relationship for each of the initiatives based on their strong, medium, weak, or no relationship. The study conducted by Pramono et al. (2018) highlighted that many organisations face challenges in implementing effective quality management tools and techniques. This is due to common difficulties such as inadequate training and support, inappropriate tool and technique use, along with poor measurement and data handling. The seven tools are utilised to identify and recognise the factors that may cause the product to fail. Furthermore, a quality improvement design is proposed to reduce the number of product defects.

Finally, QFD was applied to establish plans to produce service that meets customers' expectations, thus implementing their technical requirements to responsible relevant departmental roles. House of Quality represents the highest 15 prioritised solutions. These recommended solutions' relative weights range between 4 to 9%. The use of these tools highlights areas for improvement and the root causes of each issue. The present findings appear consistent with research undertaken by Alajhar et al. (2022) and Pramono et al. (2018). It was established that many fields could implement the seven quality management tools for problem solving, reducing product defects, and improving development in many areas.

**Action Plan**

Action	Priority	Responsible	Resources	Obstacles
Introduce the plan to all members of the organization	1	Top MGMT HR	Human Official arrangement	Resistance of change Lack of commitment
Develop a point system for each riyal spent to redeem free laundry	1	IT/ sales	Financial / IT	Customer's reaction
Reward members with vouchers from restaurants and attractive places often	1	IT/ sales	Financial / IT	Customer's reaction
Run creative promotions with Bundle offers for students, some companies, and ministries	1	Marketing/sales	Financial/marketing	Customer's reaction
Staff training for soft skills and language	1	HR	Human Official arrangement	Lack of commitment
24-hour helpline for loyal clients and other services	1	IT/customer services	Financial / Human	Human / technical
TR14: Prepare a handbook for employees, including used products tutorial	1	HR	Human Official arrangement	Lack of commitment
Self-service machine for drop-off and pick-up 24/7	1	Operations / Sales / customer services	Financial / IT/Human	Financial cost / Technical / Customer's reaction
Built-in cameras to record reception situations	2	IT/customer services	Financial / IT	Technical
Social media marketing plan for greater publicity	2	Marketing	Financial	Financial cost
Branding on a widescreen display	2	IT/customer services	Financial / IT	Technical
Customer feedback buttons in all branches	2	IT/customer services	Financial /Human/ IT	Technical
Partner with brands for detergents, stains, and spray.	2	Sales/customer services	Financial /Human	Financial cost / products quality
Aromatic incense in the store	2	Sales/customer services	Financial	Lack of commitment
Partner with services such as Uber and Careem for delivery	3	Sales/customer services	Financial/ IT	Technical / Customer's reaction

## **Conclusion**

A list of improvements was identified. Based on the analysis, tools, and outcomes, the following recommendations are provided based on this research project.

Although the customers enjoy the current traditional services, it is recommended to gradually introduce more modern services. However, customers need to be able to trust the services being provided and be encouraged to use them. The price is reasonable, and customers are willing to pay the current price. Since this aspect is one of the strengths of the service, the firm can continue to develop and improve so as to achieve consistent and sustainable features. However, promotion is considered an area that customers believe requires improvement. Therefore, it is recommended that a wealth of communication channels (i.e., SMS, social media, posters, flyers, publicity, and word of mouth, etc.) are utilised to converse with customers and advertise promotions. These offers could also be linked and associated with loyalty membership programmes.

Secondly, staff are trusted by the customers. There are several points relevant to their understanding of serving the customer with awareness sessions that take the service and customers satisfaction to the next level. Thus, the company should provide on-the-job training on how to receive customers, smile, and welcome customers. Also, it is important to ensure that they are not distracted by mobile phones or calls while customers are in the store. It was also ascertained that the staff do not promote extra services or seek to cross sell or advise. It is opined that customers are asked about any special services they require. Additionally, this area may represent an opportunity to communicate promotions or a branded labelled detergent or clothes spray. Since there are comments about private branded and labelled products being unavailable, strong and long-term partnerships should be developed with several suppliers to ensure the consistent availability of the products.

Although the customers are satisfied with the existing traditional services, it is suggested that modern and next phase services are introduced, such as self-service. Through this means, customers can take their clothes and wash them in the available machines, enjoy online services, use a drive-thru where there is no inadequate parking, in addition to minimum clothing limits. Arranging a travel bag with cleaned and ironed clothes is an extra service that customers asked for. Thus, it is recommended that the company starts this service immediately as there is no adjustment or investment required. However, it is necessary to identify the process of the customer's clothes being packed and the customer subsequently receiving them. Since the chosen firm, as a brand, is trusted, customers asked the brand to use labelled detergent products and sprays for clothes and the environment. This strong positioning may be further exploited to generate revenue.

To implement the recommendations, the support and trust of the owners and management play a key role. Staff are required to frequently undergo training so that they can provide customers with high-quality service. Serving a customer is not an ad-hoc act. It is a continuous journey that requires considerable commitment. It is therefore opined that a plan should be formulated and a task force should be created. In addition, an accountable person in charge of the actions plans and timing should ensure that the policies, plans, etc., are implemented and executed. The findings and recommendations are not only for laundry services. Hence, they could be extended and applied across a variety of sectors. However, it is vital to consider customers' needs, which is the basis for service quality. It should be noted that this finding has important implications for development.

### ***Limitations***

This research was applied in one case, which is a challenge for generalization. Furthermore, this study did not consider the services supply chain challenges and the raw material which is a major factor to deliver quality services. This research also used ServQual and did not consider the version of eServQual for electronic service store.

### ***Future Research Recommendations***

Future research may consider expanding the results so as to apply it to other cases in another context. E-laundry concept using e-ServQual may also be considered in future research. Furthermore, the model may be applied in other service industries to validate and understand the results in order to consider generalizability.

In conclusion, the study suggested that businesses focus on customer issues and make customers their main priority. Also, problems can be analysed using the seven Quality Management tools. This is a good area to extend customer needs and increase customer satisfaction. The seven quality management tools are reliable tools which companies can employ to deal with challenges, and it is effective in improving service quality. This in turn positively strengthens organisational performance, customer satisfaction, and success.

**Conflict of Interest:** The authors declare no conflict of interest.

**Data Availability:** All of the data are included in the content of the paper.

**Funding Statement:** The authors did not obtain any funding for this research.

## References:

1. Alajhar, N. A., Almiqbel, E., Alamoudi, L., Mashat, R., & Husain, K. (2022). Implementing Quality Management Tools to Improve Customer's Journey at Café. *Open Journal of Business and Management*, 10(4), 2045-2090.
2. Al-Azzam, A. F. (2015). The impact of service quality dimensions on customer satisfaction: A field study of Arab bank in Irbid city, Jordan. *European Journal of Business and Management*, 7(15), 45-53.
3. Alwan, L. L. (2011). Application of "Matrix Diagrams Tools" for quality improvement in high education. *Kufa Studies Center Journal*, 1(23).
4. Amoako, G. K. (2022). Customer satisfaction: Role of customer service, innovation, and price in the laundry industry in Ghana. *Journal of African Business*, 23(1), 146-164.
5. Angell, L. C. & Klassen, R. D. (1999). Integrating environmental issues into the mainstream: an agenda for research in operations management. *Journal of Operations Management*, 17(5), 575-598.
6. Awasthi, A. & Chauhan, S. S. (2012). A hybrid approach integrating Affinity Diagram, AHP and fuzzy TOPSIS for sustainable city logistics planning. *Applied Mathematical Modelling*, 36(2), 573-584.
7. Carnevalli, J. A. & Miguel, P. C. (2008). Review, analysis and classification of the literature on QFD—Types of research, difficulties and benefits. *International Journal of Production Economics*, 114(2), 737-754.
8. Cheng, Y. M. (2014). An exploration into cost-influencing factors on construction projects. *International Journal of Project Management*, 32(5), 850-860.
9. Fleiss, J. L., Levin, B., & Paik, M. C. (2013). *Statistical methods for rates and proportions*. John Wiley & Sons.
10. GIA. (2022). Global dry-cleaning and laundry services market to reach \$75.1 billion by 2025. Retrieved from [www.prnewswire](http://www.prnewswire).
11. Grand View Research (2021). *Dry-cleaning & laundry services market size, share & trends analysis report by services (laundry, dry cleaning, duvet clean) by region, and segment forecasts, 2020-2027*.
12. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Pearson Education Limited.
13. Jones, E., Stanton, N. A., & Harrison, D. (2001). Applying structured methods to Eco-innovation: An evaluation of the Product Ideas Tree diagram. *Design Studies*, 22(6), 519-542.
14. Kwiecińska, B. (2015). Cause-and-effect analysis of ship fires using relations diagrams. *Zeszyty Naukowe Akademii Morskiej w Szczecinie*.

15. Lemon, K. N. & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69-96.
16. Levesque, J. & Walker, H. F. (2007). The innovation process and quality tools. *Quality Progress*, 40(7), 18.
17. Lucero, A. (2015). Using affinity diagrams to evaluate interactive prototypes. In *Human-Computer Interaction–INTERACT 2015: 15th IFIP TC 13 International Conference, Bamberg, Germany, September 14-18, 2015, Proceedings, Part II 15* (pp. 231-248). Springer International Publishing
18. MacKenzie, I. S. (2012). *Human-computer interaction: An empirical research perspective*.
19. Mangiaracina, R. & Brugnoti, G. (1970). The e-commerce customer journey: A model to assess and compare the user experience of the e-commerce websites. *The Journal of Internet Banking and Commerce*, 14(3), 1-11.
20. Marinescu, N. I., Ghiculescu, D., Ghiculescu, D., & Gonczy, R. (2010). Relationship diagram and tree diagram applied at increasing flexibility of ultrasonic electro discharge machining technology. *Revista de Tehnologii Neconventionale*, 14(2), 24.
21. Madigan, J. M. (1993). Measures matrix chart: A holistic approach to understanding operations. *Quality Management Journal*, 1(1), 77-86
22. Micheaux, A. & Bosio, B. (2019). Customer journey mapping as a new way to teach data-driven marketing as a service. *Journal of Marketing Education*, 41(2), 127-140.
23. Mizuno, S. & Bodek, N. (2020). The Process Decision Program Chart (PDPC). *Management for Quality Improvement*, 1(1), 214-217.
24. Nunnally, J. C. (1994). *Psychometric theory 3E*. Tata McGraw-Hill Education.
25. Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40.
26. Pramono, S. N., Ulkhaq, M. M., Rachmadina, D. P., Trianto, R., Rachmadani, A. P., Wijayanti, W. R., & Dewi, W. R. (2018). The use of quality management techniques: The application of the new seven tools. *International Journal of Applied Science and Engineering*, 15(2), 105-112.
27. Popescu, D. & Gîrboveanu, S. (2017). The management tools used in the decision-making process. *Management and Marketing Journal*, 15(1), 151-162.

28. ReportLinker (2022). Laundry care in Saudi Arabia. Retrieved from <https://www.reportlinker.com/p0153680/Laundry-Care-in-Saudi-Arabia.html>
29. Tanimoto, S. L. (2008). Enhancing state-space tree diagrams for collaborative problem solving. In *Diagrammatic Representation and Inference: 5th International Conference, Diagrams 2008, Herrsching, Germany, September 19-21, 2008. Proceedings 5* (pp. 156-164). Springer Berlin Heidelberg
30. Tavakol, M. & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53-55.
31. Tovar-Perilla, N. J., Bermeo-Andrade, H. P., Torres-Delgado, J. F., & Gómez, M. I. (2018). Methodology to support decision-making in prioritization improvement plans aimed at agricultural sector: Case study. *Dyna*, 85(204), 356-363.
32. Wati, W. R., Anakotta, R., & Sudibyoy, D. (2020). The use of tree diagram technique in teaching vocabulary. *INTERACTION: Journal Pendidikan Bahasa*, 7(2), 63-71.
33. Widjaja, W. & Takahashi, M. (2016). Distributed interface for group affinity-diagram brainstorming. *Concurrent Engineering*, 24(4), 344-358.
34. Yee, R. W., Yeung, A. C., & Cheng, T. E. (2010). An empirical study of employee loyalty, service quality and firm performance in the service industry. *International Journal of Production Economics*, 124(1), 109-120.