

Importance Level Analysis of Pick-up Schedule for Merchant PT XYZ using QFD

Fransisca Dini Ariyanti^{1*}, and Jessica Andreas¹

¹Industrial Engineering Department, Faculty of Engineering, 11480 Bina Nusantara University, Indonesia

Abstract. The merchant's journey in the marketplace is the priority of the marketplace. Therefore, it is necessary to do research on the addition of a pick-up schedule feature to improve the journey made to merchants. A thorough analysis of the addition of the pick-up schedule feature is carried out using the Quality Function Deployment (QFD) method. Respondents' votes were obtained from selected Click & Collect merchants, namely 5 Click & Collect merchants. The results showed that the addition of the pick-up schedule feature really answered the needs of merchants.

1 Introduction

Click & Collect is a feature of PT XYZ that gives accommodation to client to do online buy and get the request at the store. In current circumstance, clients can get the request (the quickest time the item can be gotten) in no less than 1 hour of effective instalment for as long as 7 days without a distinct time. A few dealers will set up client's organization when client shows up at the store, so that condition can burn through client's time when client ought to have the option to get the request right away. Merchants, especially that have fresh products, are the side that can be harmed by this situation. If the merchant has prepared fresh products, such as meat, vegetables, fruit, or the other fresh products on the day that customer success do the payment, but customer come to the store on 5th day after the transaction is success, that can reduce the quality of fresh products that have been prepared. Products can be smelly, damaged, rotten, and not fit for consumption. This can make customers dissatisfied with the product and can file complaints.

The pick-up schedule feature can make it more straightforward for clients, both from shipper side and client side. Be that as it may, this component isn't compulsory for the two sides, from trader side and client side. If the trader would rather not have a get plan include, then, at that point, vendor can skip filling in the component, so the showcase will be same as it is presently, with the implying that client will have similar stream, not filling in that frame of mind up timetable and orders can be gotten however ahead of schedule as 1 hour after a fruitful instalment may be made. Client can likewise do likewise assuming that the dealer has a get plan highlight. Client can pick a get timetable or proceed follow the ongoing system. In the event that client doesn't pick the get plan, then client can get the request

in something like 1 hour after progress do the exchange for as long as 7 days.

From the two sides, trader side is the side that has additional advantages from the get plan include, particularly shippers who have new items. This element can assist dealers with getting ready client orders when it is close to the get time that chose by client, so vendors can keep up with the nature of the items. Shippers likewise can likewise expect takes a chance with that might happen.

Clients can pick the day and time to get the request with great quality since dealer readies the request as indicated by the time that picked by client. With the get plan highlight, clients likewise don't have to sit around idly to trusting that orders will be ready.

1.1 Objectives

The motivation behind doing explore on the expansion of the get plan include is as per the following.

1. Analyzing the impact of the get plan highlight on the PT XYZ trader experience.
2. Analyzing the impact of setting 1 timetable span that can be changed in accordance with the shipper's necessities or is adaptable on the PT XYZ dealer experience.
3. Analyzing the impact of setting the most extreme number of requests all at once on the PT XYZ trader experience.
4. Analyzing the impact of rescheduling offices in the get plan highlight on the PT XYZ trader experience.

2 Literature review

Quality Function Deployment (QFD) is an approach ordinarily involved by organizations as a type of expectation and assurance of the need needs and wants

* Corresponding author: fransisca.ariyanti@binus.ac.id, jessica.andreas@binus.ac.id

of shoppers, as need might arise and wants in items and administrations for buyers [1]. QFD is an organized technique utilized in the item arranging and improvement process as need might arise and wants, and methodically assesses the capacities of an item or administration as need might arise and wants. The idea of QFD [2] was first advanced by Dr Yoji Akao in Japan in 1966. He characterized QFD as a technique for principal quality plans to match shopper assumptions, then converted into target plans and quality basic focuses, so they can be utilized as a creation/administration advancement gradually ease in an industry.

The advantages of QFD for organizations trying to increment seriousness through enhancements to quality and efficiency incorporate [3]:

1. More client centered
In making QFD, a great deal of information is required from the client.
2. Time turns out to be more proficient
QFD can make item or administration quality improvement time more productive, on the grounds that it is more centered around what clients need.
3. There is cooperation
QFD requires more collaboration, since all choices in the assembling system require conceptualizing.
4. Orientation to documentation
One of the results of the QFD cycle is a complete report in regards to information connected with all cycles did and has an examination with client necessities.

Different advantages of executing QFD incorporate expanding item ability, item quality, consumer loyalty, correspondence, efficiency, organization benefits, decreasing opportunity to market, and diminishing plan costs. There are 3 advantages for organizations while utilizing the QFD strategy, in particular [4]:

- a. Minimize costs
This happens on the grounds that the fixes made are as per client requirements and assumptions, so there is no dreary work that doesn't meet client assumptions.
- b. Increase how much pay
By lessening costs, the outcomes got will increment. With QFD, the item or administration created by the organization will actually want to address client issues and assumptions.
- c. Reduce creation time
QFD can empower the item or administration improvement to settle on choices from the get-go in the advancement cycle.

The positive effect of utilizing the QFD framework is the advancement of cross-practical groups, working on the organization's inside correspondence, and having the option to make an interpretation of customer wants into the organization's language. Organizations with customary frameworks have more spotlight on work norms, while organizations with current frameworks center around further developing help, and quality towards consumer loyalty and accommodation [5]. QFD actually has a few weaknesses, including requiring more

shifted explicit abilities, there are hardships in finishing up the lattice, it is just an instrument and there is no reasonable critical thinking structure, and is non-stop.

There are 3 methods for deciding the degree of significance, to be specific outright significance, relative significance and ordinal significance [6].

a. Absolute Importance

Along these lines, the degree of significance can be communicated on a specific scale, with the worth of the significance of the client's voice on the plan given by the organization. The type of the situation in finding the worth of Absolute Importance is:

Information:

AI = Absolute Importance design features

In = Importance for the nth user's vote

Corn = Correlation value between user vote and nth feature design

b. Relative Importance

This technique communicates the computer-based intelligence esteem on a rate scale. The 100 scale expresses the most significant level for the respondent, which is much of the time called the proportion scale. The formula for finding the Relative Importance value is:

Information:

RI = Relative Importance Value of a feature design

Ain = Absolute Importance value of the nth design

c. Ordinal Importance

Along these lines, respondents are approached to rank their requirements as indicated by their degree of significance. In the event that there are 5 information, the request for 5 is the main characteristic and the request for 1 says the most un-significant trait.

There are a few elements of the HoQ, including [7]:

- a. Improve the adequacy of correspondence between offices
- b. Clearly recognize client needs through a direct-to-functional cycle
- c. Reduce the chance of framework changes that can happen
- d. Improving the nature of items or administrations
- e. Shorten item fabricating time
- f. Improve comprehension of intricate connections and the capacity to lessen intricacy with a more significant level of reconciliation inside the endeavour to help fulfilment
- g. Identify and resolve clashing requirements of different clients

House of Quality (HoQ) is a type of portrayal of QFD. The grid comprises of 2 fundamental parts, to be specific the level part, which connects with shoppers (client table) and the upward part called the specialized table [8]. HoQ is a device to help QFD, utilizing a grid that relates buyer wants as well as contrasting plan steps, so experts can focus on the main attributes [9]. The

expression "house" is utilized on the grounds that the instruments utilized seem to be like a house that has a few rooms and a rooftop. The HoQ framework is utilized during the time spent showing Voice of Client (VoC) or customer needs [10].

The fundamental idea of QFD is a progression of bound lattices or HoQ [11]. HoQ is a reasonable guide that has interface arranging as well as correspondence all through the item or administration improvement process. HoQ can likewise recognize client needs and focus on plan necessities to address client issues. Figure 1 is an illustration of the HoQ model alongside the important data [12].

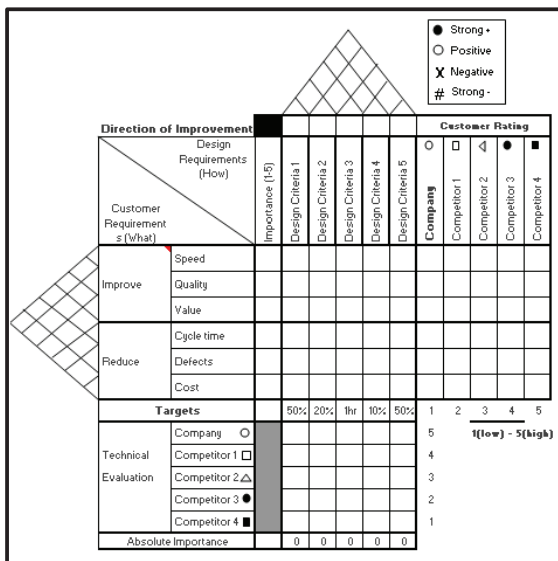


Fig. 1. House of quality (HoQ) matrix.

Type of HoQ matrix has various forms. The general form of this matrix consists of six main components, namely [13]:

1. Voice of Customer "WHATs", namely a list of requirements derived from consumer desires.
2. Voice of Organization "HOWs", which is a structured list of product characteristics that are relevant to consumer expectations.
3. Relationship Matrix, which describes the relationship between technical and customer requirements.
4. Planning Matrix "WHYs", which describes consumer perceptions observed in market surveys, including the relative importance of consumer desires, companies, company performance and competitors in meeting these requirements.
5. Technical Correlation "ROOF matrix", namely identification of technical requirements that support each other in product design.
6. Competitive Analysis "Technical priorities, benchmarks, and targets", namely the priority recorder on the technical requirements matrix, measuring the technical performance obtained by competitors' products and the level of difficulty that arises in developing requirements. The final output of the matrix is the target value for each technical requirement.

3 Methods

The stages of the process carried out in this study are depicted in the research flow chart in Figure 2.



Fig. 2. Research flow chart.

The clarification of the exploration graph as the consummation of the errands did is as per the following.

1. Start
 Making research begins from a contextual investigation of the momentum circumstance, then, at that point, it is utilized as an issue plan in the report that is made.
2. Problem Identification
 Distinguishing proof of contextual investigations is the initial step required by the creator with an end goal to recognize the issue and make the definition quantifiable as the initial phase in finishing the job. ID of contextual investigations can find and recognize the right issue for the exploration interaction as a type of following through with the job. Fundamentally, contextual analysis distinguishing proof is the following stage after the creator picks something to be talked about in the examination.
3. Formulation of The Problem
 The issue plan can be figured out by the creator after the case is recognized for the situation concentrate on distinguishing proof segment, along these lines the detailing of the issue is the subsequent stage taken by the creator. The detailing of the issue is the principal issue that can assist the creator with being more engaged in deciding the hypothesis and technique required.

4. Literature Study

Writing study was directed to track down data through records (composed reports, pictures, and electronic archives). Writing study was directed to give more information and knowledge in leading information handling and information examination.

5. Research Objectives

The motivation behind this examination which is a type of getting done with the creator's job is to investigate the impact of the get plan include on the shipper experience of PT XYZ, break down the impact of setting the greatest apportioning in 1 time on the dealer experience of PT XYZ, and dissect the impact of rescheduling offices in the get plan highlight on trader experience of PT XYZ.

6. Data Collection

Data collection is a stage used to gather data expected to take care of issues or it very well may be a method for accomplishing objectives by gathering the necessary information.

7. Data Processing

Data processing is the phase of changing over information that has been gotten through information assortment. Information handling should be possible utilizing the QFD technique on the information that has been acquired.

8. Data Analysis

Data analysis was done when the writer had gotten done with handling information, implying that the information previously upheld the examination. Information investigation is a method for making information into data and more obvious. The reason for information investigation is to track down helpful data, illuminate ends, and backing independent direction, as well as assess and create answers for different issues.

9. Conclusion

Conclusion is the outcome acquired from all exploration that has been completed beginning from information assortment, information handling, and information examination that has been summed up to answer research issues.

10. Finish

The examination closes with the choice that the get plan include is significant for PT XYZ shipper experience.

PT XYZ. The poll contains questions connected with the get plan include which was submitted to 5 PT XYZ merchants, namely Alfamart, Hypermart, 99 Ranch Market, Jiwa Group, and IT Galeri. The selected competitor is a competitor that has a product pick-up feature that has been ordered by the customer, including Alfamart, Indomaret, 99 Ranch Market, Jiwa Group, and Kopi Kenangan.

The poll circulated to 5 vendors has been finished up and can be transformed into a QFD. What will be adjusted is made in view of the items in the overview finished up by the dealer. In QFD there are additionally configuration highlights given by PT XYZ. Appraisal of contenders on client needs is additionally shown in the Client Rating segment and there is likewise an appraisal of contenders on plans given by PT XYZ in the Specialized Assessment area. The objectives for each plan that will be the focal point of PT XYZ have additionally been found in the QFD, and the significance of each plan for the get plan component of PT XYZ is recorded in the Outright Significance area which should be visible on Figure 3.

Absolute Importance (AI) is a measure that describes the level of importance of a given design. Table 1 is the result of AI data for the design of the PT XYZ pick-up schedule feature.

Table 1. AI results pick-up schedule feature design PT XYZ.

Design Requirements	Absolute Importance
New pick-up schedule feature	117
Configurable duration for each pick-up schedule	45
Maximum order slot per pick-up schedule	117
Reschedule facility	117

The size of the AI is also based on the user's voice from the questionnaire and the design made by PT XYZ and can be determined by the AI formula.

$$AI = (I1 \times Cor1) + (I2 \times Cor2) + \dots + (In \times Corn)$$

An example of calculating the AI value is done using data from the new pick-up schedule feature design:

$$AI = (I1 \times Cor1) + (I2 \times Cor2) + \dots + (In \times Corn)$$

$$AI = (5 \times 9) + (4 \times 9) + (4 \times 9)$$

$$AI = 45 + 36 + 36$$

$$AI = 117$$

The AI value for the new pick-up schedule feature design is 117.

Relative Importance (RI) is the AI value which is used as a cumulative percentage. Table 2 is the result of RI data for the design of the PT XYZ pick-up schedule feature.

Table 2. RI results design pick-up schedule feature PT XYZ.

Design Requirements	Absolute Importance	Relative Importance
New pick-up schedule feature	117	0,30
Configurable duration for each pick-up schedule	45	0,11
Maximum order slot per pick-up schedule	117	0,30
Reschedule facility	117	0,30
Total	396	1

4 Data collection

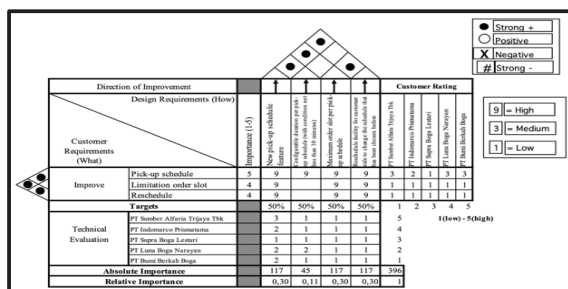


Fig. 3. QFD questionnaire of pick-up schedule feature.

The exploration was directed to gather information by making a poll given to traders who use Click & Collect

The RI value can be found by dividing the AI value of one design by the AI value of the entire design according to the RI formula.

$$RI = AIn / \text{Total AI}$$

An example of calculating the RI value is done using data from the new pick-up schedule feature design:

$$RI = AIn / \text{Total AI}$$

$$RI = 117/396$$

$$RI = 0,30 \text{ (round up of } 0,295)$$

$$RI = 30\%$$

The RI value of the new pick-up schedule feature design is 30%.

5 Results and discussion

Client requirements might have a relationship with each other or might not have a relationship with each other. In any case, in the QFD filled by a few traders who utilize the Snap and Gather technique for PT XYZ, the voices of vendors in regards to needs have a relationship with one another. The requirement for restricting request spaces per get plan is most certainly connected with the requirement for a get plan, so the connection between the two necessities is exceptionally sure. The requirement for rescheduling offices is additionally certainly connected with the requirement for a get plan, so the connection between the two necessities is exceptionally sure. The requirement for restricting request spaces per get plan should likewise be connected with the requirement for rescheduling offices, so the connection between request opening limitations and rescheduling is extremely certain.

The primary client prerequisite in QFD in regards to the get plan is the gets plan. The plan of the new get plan highlight given by PT XYZ has a worth of 9 against the get plan, showing that it has an exceptionally amazing relationship. This happens on the grounds that the plan given by PT XYZ is as per the client's requirements, where the client needs a get timetable and PT XYZ gives another get plan highlight plan. The plan of the term highlight that can be changed by the vendor's necessities has a worth of 9 against the get plan, showing that it has an exceptionally amazing relationship. This happens on the grounds that the span that can be changed by the trader's necessities can make it simpler for vendors to go through the pick plan include. The plan of the greatest request limit include per plan has a worth of 9 against the get plan showing that it has an exceptionally amazing relationship. This happens on the grounds that the most extreme cut off per timetable will assist dealers in the get plan with highlighting, where assuming there is a promotion, there will be no over-burden or there will be cases assuming there is just 1 worker in the store, so orders won't be missed assuming they are inside the breaking point. proper. The plan of the rescheduling office for clients has a worth of 9 against the get plan demonstrating that it has an extremely amazing relationship. This happens in light of the fact that the rescheduling office is absolutely essential for the get plan.

The second client necessity in QFD with respect to the get plan is the limit of request openings. The plan of

the new get plan include given by PT XYZ has a worth of 9 against the request opening limit, demonstrating that it has an extremely amazing relationship. This happens in light of the fact that the request space impediment will exist assuming there is a get plan highlight, additionally the request opening limit can make it simpler for dealers to answer client orders, so that no orders will be remembered fondly or wrong. The plan of the term include that can be changed by the dealer's necessities has no worth in restricting the request opening, demonstrating that there is no connection between the two things. The impediment of request openings with flexible span has somewhat of a staying point. The plan of the most extreme request limit highlight per plan has a worth of 9 against the request opening restriction, demonstrating that it has an exceptionally amazing relationship. This is on the grounds that the plan given by PT XYZ is as per the client's requirements, wherein the client needs to restrict the request space and PT XYZ furnishes a plan include with a greatest constraint of orders per plan. The plan of the rescheduling office for clients has a worth of 9 against the request opening restriction, showing that it has an exceptionally impressive relationship. This happens on the grounds that the rescheduling should acclimate to the accessibility of the request space limit, in the event that there is no accessible opening, you need to search for another timetable.

The third client necessity in QFD with respect to the get plan is rescheduling. The plan of the new get plan highlight given by PT XYZ has a worth of 9 for rescheduling, demonstrating that it has an exceptionally amazing relationship. This happens in light of the fact that the rescheduling office will exist assuming there is a get plan highlight, where the client can change the timetable that has been set if incapable to come, so consumer loyalty with the trader is kept up with. The plan of the span include that can be changed by the vendor's necessities has no worth to reschedule, showing that there is no connection between these 2 things. Include configuration can be set by the necessities of the dealer, doesn't have an incentive for rescheduling, showing that there is no connection between these 2 things. The plan of the most extreme request limit highlight per plan has a worth of 9 to reschedule, showing that it has an exceptionally amazing relationship. This happens in light of the fact that rescheduling should change in accordance with the accessibility of the greatest request limit, in the event that there is no accessible opening, you need to search for another timetable. The plan of the rescheduling office for clients has a worth of 9 to rescheduling showing an extremely amazing relationship. This happens in light of the fact that the plan given by PT XYZ is as per the client's requirements, where the client needs a rescheduling and PT XYZ gives a rescheduling office include plan for the client.

The plan of the get plan highlight has an up bolt, since PT XYZ needs to give greatest get elements to clients. The plan of the span include that can be changed by the trader's requirements has an up bolt, since PT XYZ believes vendors should have the option to change the length as per the shipper's desires or at the end of the

day the get timetable can be adaptable, so it can make it simpler for dealers. The plan of the greatest request limit include per plan has a vertical bolt, since PT XYZ believes vendors should work well for clients, so that nothing is missed or wrong traders actually get great criticism from clients. The rescheduling highlight plan for clients has an up bolt, since PT XYZ believes that vendors should have the option to keep up with item quality in the event that the client unexpectedly can't come to get.

Configuration elements can have a relationship with each other or it might not have a relationship with each other. The term plan that can be changed by the shipper's necessities is most certainly connected with the plan of the get plan include, since, in such a case that there is no get plan, there will no span set by the vendor's requirements, so the connection between the two plans is extremely sure. The plan of the greatest request limit include per plan is surely connected with the plan of the get plan highlight, since, in such a case that there is no get plan, there will be no most extreme request limit per plan, so the connection between the two plans is exceptionally certain. The plan of the rescheduling office highlight for clients is additionally obviously connected with the plan of the get plan include, since, supposing that there is no get plan, there will be no rescheduling office, so the connection between the two plans is exceptionally sure. The plan of the term setting highlights as indicated by the trader's necessities has no relationship with the most extreme request limit per plan, on the grounds that the greatest request per plan limit is additionally set by the dealer's requirements, so there is no connection between the two plans. The plan of the span setting highlights as indicated by the trader's necessities additionally has no relationship with the most extreme request limit per plan, on the grounds that rescheduling just focuses on the accessibility of spaces in the timetable and doesn't reschedule won't be impacted by the term per plan, so there is no connection between the two plans. The plan of the most extreme request limit highlight per plan is connected with the plan of the reschedule office include, on the grounds that rescheduling should acclimate to the accessibility of the request space limit, in the event that there is no accessible opening, you need to search for another timetable, so the connection between the two is exceptionally sure.

The QFD part has an objective segment for each element plan that will be made. The get plan highlight plan that will be made has an objective of half, implying that the plan has a most extreme accomplishment target. The plan of the length highlight that can be set by the necessities of the dealer to be made has an objective of half, implying that the plan has a most extreme accomplishment target. The plan of the most extreme request limit highlight per plan has an objective of half, implying that the plan has a greatest accomplishment target. The plan of the rescheduling office include for clients has an objective of half, implying that the plan has a most extreme accomplishment target.

Deciding the plan of significant highlights is in the Outright Significance (artificial intelligence) segment. The artificial intelligence esteem is gotten from the

amount of each element plan connection and client needs on each voice interest of client needs. The get plan include configuration has a computer-based intelligence worth of 117 which shows that the plan has a high significance, in light of the fact that the get plan highlight configuration is the primary plan in making the get plan highlight and truly meets all client needs. The plan of the length setting highlight as per the dealer's requirements has a man-made intelligence worth of 45 which shows that the plan has low significance, in light of the fact that the plan of the term setting highlight as per the trader's necessities doesn't have a lot to do with the voice of the client's necessities, just connects with 1 client's voice, to be specific the requirement for pick-up plan. The plan of the greatest request limit highlight per plan has an artificial intelligence worth of 117 which demonstrates that the plan has a high significance, on the grounds that the plan of the most extreme request limit include per plan has a genuinely impressive relationship with the voice of client needs. The plan of the reschedule office highlight for clients has a man-made intelligence worth of 117 which shows that the plan has a high significance, on the grounds that the plan of the reschedule office include for clients has a genuinely amazing connection with the voice of client needs. The absolute worth of artificial intelligence in the QFD get plan is 396.

The worth of the Relative Significance (RI) part is the quantity of component plan artificial intelligence values per all man-made intelligence values in QFD, where the outcome is in rate structure. The get plan include configuration has a RI worth of 0.30, the term setting highlight configuration as per the vendor's necessities has a RI worth of 0.13, the component plan for the greatest number of requests per plan has a RI worth of 0.30, and the reschedule office highlight plan for clients has a RI worth of 0.30.

The addition of the pick-up schedule feature that will be carried out by PT XYZ requires views from users and users' views of other competitors, as well as the design of the pick-up schedule owned by competitors. The most appropriate method to obtain the requirements for making these features is the QFD method. Merchants who participated in the questionnaire were Alfamart, Hypermart, 99 Ranch Market, Jiwa Group, and IT Galeri. The competitors in QFD are Alfamart, Indomaret, 99 Ranch Market, Jiwa Group, and Kopi Kenangan.

The significance of client voices is in the client prerequisites (what) area for the get plan highlight, which has 1 vital point and 2 other significant focuses, where the connection between every client's voice is extremely sure as displayed in Figure 2.3. The plan highlight gave by PT XYZ to the get plan include has 4 focuses that can answer the necessities of the client, where these focuses expand plan boundaries that expect to improve on the shipper's excursion. The plan highlights have a positive relationship with one another and have no regrettable relationship with each other. The plan focuses for the get plan highlight given by PT XYZ is half for each component plan. This shows that these element plans have a most extreme accomplishment target. Client evaluations for

contenders against client requirements can be expressed as not adequately answering client needs, since there are still a few inadequacies from contenders.

Contenders who have a get plan include are not better than the plan of the get plan highlight given by PT XYZ. The plan given by PT XYZ enjoys its own benefits and uniqueness that contenders don't have. The get plan configuration has significance, the greatest number of requests per plan, and the reschedule configuration has an extremely high significance, and the adjustable term configuration has a genuinely high significance.

6 Conclusion

The get plan include is extremely persuasive on the PT XYZ shipper experience. This component can be supposed to be vital in further developing the PT XYZ trader experience, particularly shippers who are individuals from Snap and Gather, regardless of whether they have new items. Traders can stay away from an abatement in item quality and can expect different dangers that might happen.

The term setting in 1 time that can be changed by the vendor's necessities doesn't actually influence the PT XYZ shipper experience. This component is very wanted by shippers, however it's anything but an element required by vendors, since dealers don't generally disapprove of a proper time on each timetable, for instance 30 minutes for every timetable, 1 hour for every timetable, 3 hours for every timetable, etc.

The greatest number of requests in a single time influences the PT XYZ trader experience. This component is significant for traders, so shippers can put down a boundary on the quantity of orders, so that during specific huge occasions, for instance, there are just not many promotions and representatives in the store, everything client orders can be taken care of appropriately by the vendor, without missing anything or setting up the request inaccurately.

The rescheduling office gave to clients influences the PT XYZ dealer experience. This office can be given to the client on the off chance that the vendor has not squeezed the acknowledge request button and rescheduling must be done once by the client. This element is significant for vendors, since this component works when the client can't take orders on the timetable that has been made. On the off chance that the client can't get the request around then, the request won't be ready for that time, so the shipper can keep away from any conceivable harm.

References

1. A. A. Bolar, S. Tesfamariam, R. Sadia, *Framework for prioritizing infrastructure user expectations using quality function deployment (QFD)*, International J. Sustainable Built Environment **6**, 1, pp. 16-29 (2017)
2. A. M. Oddershede, L. E. Quezada, J. E. Valenzuela, P. I. Palominos, H. Lopez-Ospina, *Formulation of*

- a manufacturing strategy using the house of quality*, Procedia Manufacturing **39**, pp. 843-850 (2019)
3. A. Robayo-Avenidaño, *A simplified strategy based on the house of quality to prioritize farming practices under variable weather conditions*, Quality Management J. **29**, 1, pp. 34-50 (2021)
4. D. L. Goetsch, S. B. Davis, *Quality management for organizational excellence: introduction to total quality* (Pearson, Harlow, 2013)
5. F. Dianawati, H. Hanif, L. Maiciptaani, *Strategy of service quality improvement for commuter line Jabodetabek train using integration methods of SERVQUAL and Kano model into house of quality*, AIP Conference Proceedings **2194**, 020021 (2019)
6. F. N. Pugileri, A. R. Ometto, R. Salvador, M. V. Barros, C. M. Piekarski, I. M. Rodrigues, O. Diegoli Netto, *An environmental and operational analysis of quality function deployment-based methods*, Sustainability **12**, 8, pp. 3486 (2020)
7. J. Huang, L. X. Mao, H. C. Liu, M. S. Song, *Quality function deployment improvement: a bibliometric analysis and literature review*, quality & quantity **56**, pp. 1247-1366 (2021)
8. L. H. Chen, W. C. Ko, F. T. Yeh, *Approach based on fuzzy goal programming and quality function deployment for new product planning*, European J. Operational Research **259**, pp. 654-663 (2017)
9. M. Abdel-Basset, R. Mohamed, A. E. H. Zaied, F. Smarandache, *A hybrid plithogenic decision-making approach with quality function deployment for selecting supply chain sustainability metrics*, Symmetry **11**, 7, pp. 903 (2019)
10. N. O. Erdil, O. M. Arani, *Quality function deployment: more than a design tool*, International J. Quality and Services Sciences **11**, 2, pp. 142-166 (2019)
11. X. Wu, H. Liao, *An approach to quality function deployment based on probabilistic linguistic term sets and ORESTE method for multi-expert multi-criteria decision making*, Information Fusion **43**, pp. 13-26 (2018)
12. Y. He, X. D. Liang, F. M. Deng, Z. Li, *Emergency supply chain management based on rough set – house of quality*, International J. Automation and Computing **16**, pp. 297-309 (2019)
13. Z. Tang, H. Dinçer, *Selecting the house-of-quality-based energy investment policies for the sustainable emerging*, Sustainability **11**, pp. 3514 (2019)