DEVELOPMENT OF SME'S BUSINESS COOPERATION INFORMATION TECHNOLOGY SYSTEM DESIGN

Suhartini Suhartini
Corresponding author
Master in Industrial Engineering
Department of Industrial Engineering Technology
Industrial Engineering Study Program
Institut Teknologi Adhi Tama Surabaya
Jl. Arief Rahman Hakim No.100, Klampis Ngasem, Kec. Sukolilo,
Kota Surabaya, Jawa Timur, Indonesia, 60117
E-mail: suhartini@itats.ac.id

Nina Aini Mahbubah
Doctor of Industrial Engineering
Department of Industrial Engineering Technology
Industrial Engineering Study Program
Universitas Muhammadiyah Gresik
Jl. Sumatera No.101, Gn. Malang, Randuagung, Kec. Kebomas,
Kabupaten Gresik, Jawa Timur, Indonesia, 61121

Mochammad Basjir
Master in Industrial Engineering
Department of Engineering
Mechanical Engineering Study Program
University Islam Malang
Jalan Mayjen Haryono No.193, Dinoyo, Kec. Lowokwaru,
Kota Malang, Jawa Timur, Indonesia, 65144

The government has a goal to improve the economy of SMEs. The improvement of the SME economy is carried out by accelerating the National digital transformation. At this time, SMEs have become members of the National digital program. SMEs must have the ability to run their business digitally through collaboration. Meanwhile, SMEs still have obstacles in implementing the collaboration system. The obstacle is that it is less effective and efficient to use digital business collaboration systems. Collaboration systems are less effective in the steps and time of use in business collaboration systems. SMEs want an easy and fast collaboration system. SMEs hope to have a collaboration system that can respond to consumer needs. Thus, the design of the collaboration system must meet the needs of SMEs to improve their performance. This research aims to design a collaborative system for SMEs innovation businesses. The collaborative system design is expected to respond to any changes in SMEs activities. By reacting quickly, the productivity of SMEs will increase because an effective collaboration system supports it. This study uses the method of Service Quality and Quality Function Deployment (QFD). Based on the technical response, project description (0.24), project status (0.17), collaboration team (0.16), project activities (0.15), project needs (0.13), special issues (0.07) and project performance (0.06) were selected as the proposed improvement and development by the priority of contribution in the QFD analysis. These attributes are prioritized in designing the SMEs collaboration system. A collaboration system was created for SMEs to increase their productivity

Keywords: service quality, quality function deployment, collaboration, business innovation, information, SMEs

1. Introduction

The number of SMEs registered as members of the National digital program is 15.3 million out of 64.2 million. The Indonesian government hopes to hold the National digital program to increase the marketing of SMEs products. In 2030, the government is targeting 30 million SMEs to become national digital members, increasing the number of SMEs. Traditional collaboration is a system that is carried out directly, dealing with suppliers and customers in transforming business systems.

At this time, SMEs are faced with many competitors. SMEs must have a strategy to improve product quality. One strategy is to increase effectiveness and efficiency in production activities. This can be done through collaboration. The collaboration aims to accelerate response to market conditions. Market conditions are rapidly changing, so SMEs must meet consumer needs. SMEs collaborate with stakeholders. Stakeholders are customers, suppliers, and SMEs partners. SMEs want a collaboration design using information technology systems.

Therefore, studies that are devoted to identifying the attributes of the needs of SMEs in designing collaboration systems are of scientific relevance. The results of the attribute needs of SMEs will be prioritized in designing collaboration systems.

2. Literature review and problem statement

The paper [1] presents the results of research on e-business collaboration, showing a positive influence between collaboration and business. However, there are unresolved problems related to implementing business collaboration systems. The reason is the lack of social aspects in the application of collaboration. The way to overcome these difficulties will be to measure the relationship between collaboration, business, and society. The paper [2] presents research results on social

information systems and marketing. It is shown that many competitors are using online marketing systems, but there are unresolved problems related to the decline in consumer demand. The reason is that the marketing system is still not optimal. This is due to a large number of competitors.

The paper [3] presents agile, social, and customer information results. It is shown that there is an influence of agile, social, and customer information, but there are unresolved problems related to agility in responding to consumer needs. The reason is the lack of company resources. The way to overcome these difficulties is to increase the company's resources.

The paper [4] presents the marketing research results. The relationship between marketing and customer relationship management is shown. However, there are unresolved problems related to customer requests. The reason is that customers need the knowledge to implement digital marketing. Ways to overcome these difficulties can be done by providing training to customers. The paper [5] presents the results of research on the development of new products. It is shown that customers have fast-changing desires, but there are unresolved problems related to meeting customer needs. The reason is the significant lack of information on product needs. In product development, ways to overcome these difficulties can be applied to the agile concept. The paper [6] presents the results of research on improving SME marketing. It was shown that digital marketing is significant for SMEs, but there are unresolved problems related to information on marketing. The reason is the lack of a quick response to customer desires. The way to overcome these difficulties can be done by implementing B2B and B2C.

The paper [7] presents the results of research on agile. It is shown that digital marketing is significant, but there are unresolved problems related to the lack of response to customer requests. The reason is that the company is less than optimal in marketing products. The way to overcome these difficulties can be to create an agile marketing system. The paper [8] presents the research results on manufacturing organizations, showing an influence between digital capabilities and organizations on manufacturing. However, there are unresolved problems related to organizational systems in determining resources. The reason is the costs incurred to fulfill resources. The approach taken in the previous research shows the importance of increasing digital marketing. Increasing digital marketing can be done with business collaboration.

3. The aim and objectives of the study

The study aims to design a collaborative system for SMEs.
To achieve this aim, the following objectives are accomplished:

– to identify the voice of customer attributes to design business collaboration systems;
– to determine the technical characteristics to meet the needs of SMEs in designing business collaboration systems;
– to create a House of Quality to determine the priority level of attributes used in the design of business collaboration systems.

4. Materials and methods

The study aims to design a collaborative system for SMEs innovation businesses. The collaborative system design is expected to respond to any changes in SMEs activities. By responding quickly, the productivity of SMEs will increase because an effective collaboration system supports it. The government has a goal to improve the economy of SMEs. The improvement of the SMEs economy is carried out by accelerating the national digital transformation. Currently, SMEs have become members of the National digital program [9]. SMEs have collaborated with suppliers and customers. SMEs use collaboration traditionally [10]. Fig. 1 below shows the collaboration system implemented by SMEs.

Fig. 1 above shows that SMEs need a business collaboration system design. The collaboration system is made in the form of an application to accelerate coordination between SMEs, consumers, and suppliers. Fast coordination will increase the efficiency of SMEs. Efficient activities will increase the productivity of SMEs to increase profits.
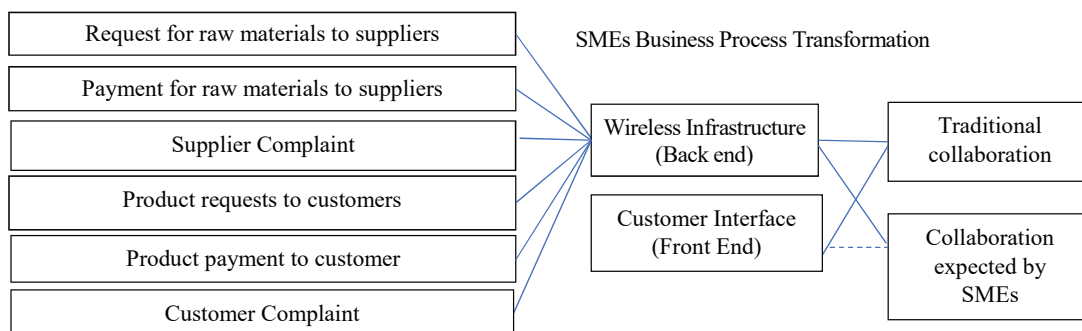

Fig. 1. SMEs collaboration system

The study explores manufacturing companies and customers to create digital service innovations to address digitization. The research provides insight into companies that perform agile creation processes in the digital era [11]. The study examines the relationship between intellectual agility, entrepreneurial leadership, micro, and small businesses innovation, and economic efficiency [12]. Cognitive computing ushered in the industrial revolution through increased accuracy, scalability, and personalization. Therefore, business-to-business (B2B) organizations consider making decisions to be adopted into digital marketing initiatives [13]. The work provides an overview of organizations at various levels of maturity in the management and development of AMC based on "agile" carried out around four dimensions [14]. Industrial companies claim that collaboration can face high supply uncertainty, intense competition, and technological turbulence [15]. The research states that digital marketing is strongly influenced by resources, marketing,

and frequency of updates by resources in Place Management Partnership companies [16]. This research creates a collaborative service framework in Agile Digital Transformation [17]. The research discusses agility in the context of international business and the main aspects of strategic agility [18]. The study analyzes, maps, and measures flexibility and agility in international business [19].

The work shows that companies understand agile management practices with continuous development, management, and engineering practices [20]. Agile can effectively increase collaborative innovation internally, namely employees, and externally, namely the market [21]. Readiness for change in helping SMEs adopt a digital-based economy is considered in [22]. This research integrates data-driven methods into digital marketing, and exponential technical advances provide opportunities for strategic advantage [23]. The results showed a positive influence between management system control and budget [24]. According to [25], the study discusses the strategy of SMEs to increase productivity. One of the strategies used by SMEs is collaboration. The heuristic method generates an enterprise architecture (EA) model as a project prototype [9]. The research contributes to the literature on sustainable innovation by describing appropriate processes for developing a green environment for collaborative, sustainable innovation [26].

The study provides a practical theory for a service system platform to optimize team collaboration efficiency and select team members objectively and fairly [27]. The company effectively undertakes Collaborative Product Development. The purpose of doing collaboration is to solve problems with distinct possibilities [28]. Collaboration is an essential factor in successful product development [29].

The research was conducted qualitatively and quantitatively. The method used is Service Quality and Quality Function Deployment. The Service Quality method is used to measure customer satisfaction with the service system [30]. This research has the following steps:

1. Creating a questionnaire to measure the level of satisfaction and expectations of the SME collaboration system. The questionnaire consisted of the first and second-stage questionnaires.

2. Creating an open questionnaire to determine respondents' expected attributes in the SME collaboration system.

3. Designing the first stage of the questionnaire. The first stage of the questionnaire aims to determine respondents' satisfaction levels and expectations in the SME collaboration system.

4. Conducting validity test, reliability test, and data adequacy test. According to [31], the validity test describes the level of ability of the measuring instrument used to reveal several main measurement targets so that it can be used to determine the accuracy of the questionnaire. If the calculated r-value>the value in the r table is positive, it is declared valid [32]. According to [33], a reliability test is a tool used to repeat measurements to get consistent measurement results.

5. Calculating the gap between the level of satisfaction and expectations of respondents. Attributes with a negative value indicate the need for improvement in the SME collaboration system.

6. Improvement of the collaboration system using the QFD method. The first step in the QFD method is to determine the voice of the customer. Voice of customer uses an attribute with a negative value from the gap calculation result.

7. Voice of customer data is used to make technical responses. Technical responses are used to answer customer needs. The relationship between the two is determined by the customer's voice and the technical response.

Quality of service as a service provider to customers according to digital needs. According to [34], service quality is a dynamic condition of service products, human resources, processes, and the environment to meet customer needs and desires. According to [35], customer satisfaction is a customer's expectation of a product or service that suits the customer's wishes. If the product is far below expectations, the customer will be dissatisfied. On the other hand, if the product meets expectations, the customer will be satisfied. Customer satisfaction causes customers to purchase, be loyal, and provide recommendations by word of mouth [38]. The company can increase customer loyalty by communicating and interacting effectively and efficiently [36]. This study uses the following mechanism (Fig. 2).
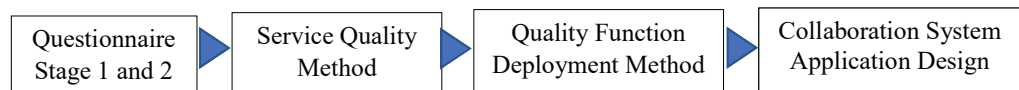
| Questionnaire Stage 1 and 2 | ▶ | Service Quality Method | ▶ | Quality Function Deployment Method | ▶ | Collaboration System Application Design |

Fig. 2. The flow of this study

5. Results of research on determining customer needs and technical response

5. 1. Determining the attributes according to the voice of the consumer

Questionnaire distribution activities were carried out on 1–17 June 2022. The distribution of the first stage of the questionnaire consists of 25 attributes, and an empty column is available to obtain additional attributes from the respondents. Then the first phase of the questionnaire was distributed to users of the collaboration system, as many as 30 respondents. The following Fig. 3 shows the characteristics of respondents for the first questionnaire.

From the distribution of 30 questionnaires, the first stage obtained two additional attributes. In preparing the second questionnaire stage, these two attributes will be added. Thus, the total attributes of the second phase of the questionnaire are 27 attributes. The following Table 1 shows the attributes desired by business collaboration system users.

Based on the table above, this study has 27 attributes of the voice of the customer. These attributes are used to make the second phase of the questionnaire. The second phase of the questionnaire is to determine SMEs' level of importance, satisfaction, and expectations in the design of business collaboration systems.

The questionnaire aims to determine the satisfaction and expectations of users of the collaboration system. Questionnaires were distributed between June 20–30, 2022. The questionnaires were distributed to users of the collaboration system, with as many as 120 respondents. Fig. 4 shows the recapitulation of the second stage of the questionnaire distribution.

The goal is to measure the level of expectation, importance, and satisfaction of the business collaboration system. The results of the questionnaire will be processed to

determine the score gap of the respondents. The score gap shows a negative value of 20 attributes and a positive value of 7 attributes. The following Fig. 5 shows the results for the difference between the level of expectation and the level of satisfaction of the respondents.
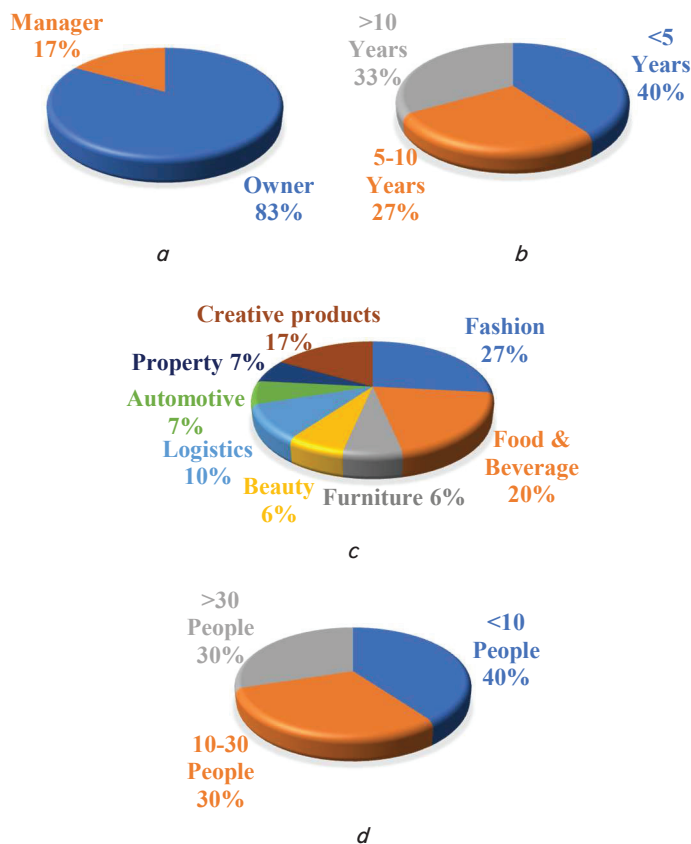

Fig. 3. The main signature: *a* — job characteristics; *b* — characteristics of types of companies; *c* — characteristics of company age; *d* — characteristics of the number of employees

From the picture above, a negative score means that the respondent has not reached the level of satisfaction in using the business collaboration system. Thus, it is necessary to make improvements in making business collaboration systems. In distributing the questionnaire, the minimum required sample adequacy must be met. By using Bernoulli's formula, the minimum sample can be calculated. The result of the calculation is 54. Thus, if the number of samples taken is >*n*, the sample is declared sufficient. Because the number of samples taken is 112, the samples have met the minimum number of samples, namely 112>54. While in the second questionnaire, which is a closed questionnaire, 112 questionnaires were distributed. The results of the questionnaire will be tested for validity and reliability. In the second stage of distributing the questionnaire, the characteristics of the respondents and the number of respondents are positions (78 % owner, 22 % manager), the type of company (16 % fashion, 13 % food & beverage, 10 % furniture, 12 % beauty, 13 % logistics, 12 % automotive, 9 % property, 16 % creative products), company age (38 % less than 2 years, 34 % between 2–5 years, 29 % more than five years), number of employees (34 % less than ten people, 31 % between 10–30 people, 35 % over 30 people). The next stage is to perform data processing. Questionnaire data were processed using SPSS v.16 software. The validation test results show that the level of satisfaction and expectation has a value of more than 0.3291. Thus, all attributes are declared valid.
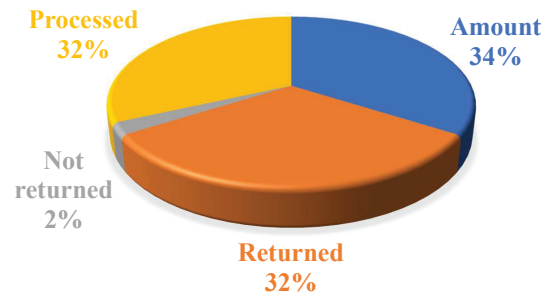

Fig. 4. Recapitulation of questionnaire distribution

Table 1

Attributes of Voice of Customer

No.	Attribute	G	I	S	Gap	NRW	IR	SP	RW
1	2	3	4	5	6	7	8	9	10
1	Project Variation Description	4.64	0.038	4.36	−0.28	3.1 %	1.064	1	0.041
2	Team/Project Member Information	4.46	0.037	4.36	−0.1	3.4 %	1.023	1.2	0.045
3	Detailed Activity Description	4.54	0.037	4.2	−0.34	3.7 %	1.081	1.2	0.049
4	Project Open/Close Status Information	4.57	0.038	4.36	−0.21	3.0 %	1.048	1	0.039
5	Process Completion Information in Gantt Chart	4.51	0.037	4.02	−0.49	4.8 %	1.122	1.5	0.063
6	Project Completion Early Warning Information	4.44	0.037	4.03	−0.41	4.6 %	1.102	1.5	0.060
7	Information as Head, Member, and Buyer	4.48	0.037	4.14	−0.34	4.6 %	1.082	1.5	0.060
8	Project Name/Title Information	4.49	0.037	4.25	−0.24	3.0 %	1.056	1	0.039
9	Project Number Information	4.48	0.037	3.61	−0.87	4.2 %	1.241	1.2	0.055
10	Information on the General Description of the Company	4.43	0.037	3.81	−0.62	3.9 %	1.163	1.2	0.051
11	Joint Project Description	4.51	0.037	4.03	−0.48	3.8 %	1.119	1.2	0.050
12	Estimated Working Time	4.48	0.037	4.42	−0.06	4.3 %	1.014	1.5	0.056
13	Project Creation Start Information	4.44	0.037	4.14	−0.3	3.6 %	1.072	1.2	0.047
14	Product Price Information	4.34	0.036	4.12	−0.22	3.5 %	1.053	1.2	0.045
15	Information on the Number of Products	4.46	0.037	4.36	−0.1	3.4 %	1.023	1.2	0.045
16	Product Requirement Information	4.47	0.037	4.36	−0.11	3.5 %	1.025	1.2	0.045

Continuation of Table 1

1	2	3	4	5	6	7	8	9	10
17	Personal Contact Information	4.36	0.036	4.25	−0.11	2.8 %	1.026	1	0.037
18	Information on Unfulfilled Activity Needs	4.47	0.037	4.36	−0.11	3.5 %	1.025	1.2	0.045
19	Project Progress Percentage Information	4.53	0.037	4.36	−0.17	3.6 %	1.039	1.2	0.047
20	Project Status Repair/Correction Information	4.58	0.038	4.35	−0.23	3.6 %	1.053	1.2	0.048
21	Company Experience Information	4.51	0.037	4.43	−0.08	3.5 %	1.018	1.2	0.045
22	Status Information for Each Activity	4.54	0.037	4.35	−0.19	3.0 %	1.044	1	0.039
23	Project Owner Name Information	4.46	0.037	4.36	−0.1	3.4 %	1.023	1.2	0.045
24	Description of Project Needs Priority	4.54	0.037	4.2	−0.34	3.7 %	1.081	1.2	0.049
25	Information on the number of clients	4.57	0.038	4.36	−0.21	3.0 %	1.048	1	0.039
26	Portfolio Information/Team Profile	4.51	0.037	4.03	−0.48	4.8 %	1.119	1.5	0.062
27	Project Capability Rating Information	4.54	0.037	4.03	−0.51	4.8 %	1.127	1.5	0.063

Note: G – goal; I – importance; S – satisfaction; NRW– normalized raw weight; IR – improvement ratio; SP – sales point; RW – raw weight
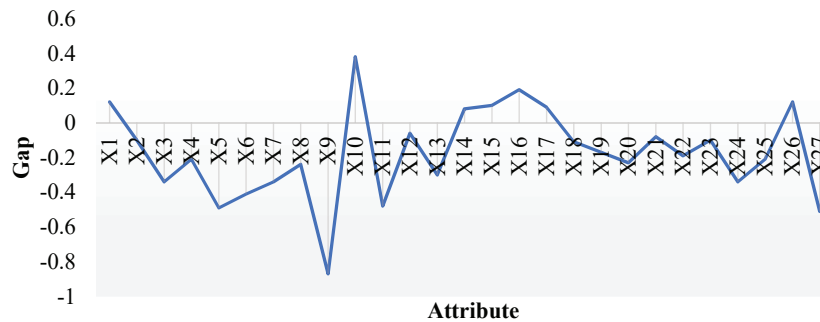

Fig. 5. Score gap

5. 2. Determining technical characteristics

These attributes are used as a basis for making technical responses. The technical response was determined by nine people, consisting of 3 academics, three practitioners, and 3 SME owners. The results of the discussion in determining the technical response can be seen in Table 2.

Table 2

Technical Response of the SMEs Collaboration System

No.	Technical Response	Attribute	Code
1	Project Description	Project Name/Title Information	X1
		Project Number Information	X2
		Project Creation Start Information	X3
		Project Owner Name Information	X4
		Project Capability Rating Information	X5
2	Collaboration Team	Team/Project Member Information	X6
		Information as Head, Member, and Buyer	X7
		Portfolio/Team Profile Information	X8
3	Project Status	Project Open/Close Status Information	X9
		Estimated Time Information	X10
		Project Progress Percentage Information	X11
		Project Status Repair/Correction Information	X12
		Status Information for Each Activity	X13
4	Project Needs	Description of Project Needs Priority	X14
5	Project Activities	Detailed Activity Description	X15
		Joint Project Description	X16
		Information on Unmet Activity Needs	X17
6	Project Performance	Process Completion Information in Gantt Chart	X18
		Project Completion Early Warning Information	X19
7	Special Issues	Company Experience Information	X20

The table above shows that there are 20 attributes of consumer needs. These attributes will be responded to by the development team in 7 technical responses. The technical response will be used as a basis for determining the priority of the SME business collaboration system design.

5. 3. Creating a House of Quality

Based on the attributes of the voice of the customer and technical response, a House of Quality is created. The House of Quality aims to produce business collaboration system design priorities desired by SMEs. Based on the data above (Table 2), namely the voice of customer attribute, Fig. 6 shows the respondents' level of importance, satisfaction, and expectations.

Based on the data above (Table 2), namely the voice of customer attribute, Fig. 7 below shows the normalized raw weight value obtained by multiplying the improvement ratio, sales point, and important ratio.

Based on the value of the normalized raw weight and the relationship between the voice of the customer, the contribution of the priority collaboration system to the business collaboration system design can be determined. Fig. 8 below shows the relative contribution value.

The results of the study show the value of priority technical response rankings in designing the SMEs business collaboration system. The design will be made in the form of a software application. With this application, it will be easier for SMEs to run their business. The following Fig. 9 shows the design of the SMEs collaboration system.
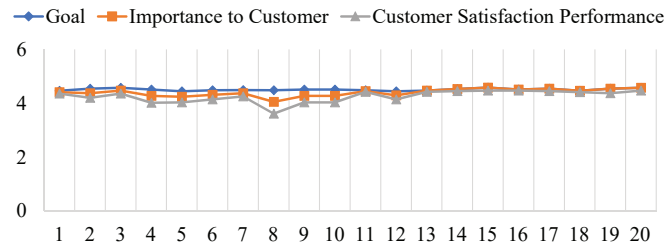
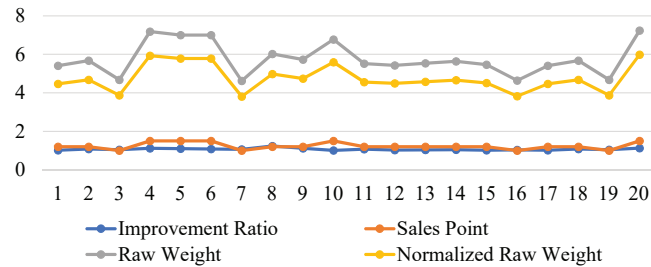Fig. 6. Results of the second stage of the questionnaire

Fig. 7. Normalized raw weight value

| Attribute / Technical Characteristics	Normalized Raw Weight (%)	Project Description	Collaboration Team	Project Status	Project Needs	Project Activities	Project Performance	Special Issues
Team/Project Member Information	4.47	△	●	–	–	○	–	–
Detailed Activity Description	4.68	○	–	–	–	●	–	–
Project Open/Close Status Information	3.87	–	–	●	–	–	–	–
Process Completion Information in Gantt Chart	5.93	○	○	○	–	△	●	○
Project Completion Early Warning Information	5.78	○	○	○	–	△	●	○
Information as Head, Member, and Buyer	5.78	△	●	–	–	–	–	–
Project Name/Title Information	3.81	●	–	–	○	–	–	–
Project Number Information	4.98	●	–	–	○	–	–	–
Joint Project Description	4.74	○	–	–	–	●	–	–
Estimated Time Information	5.59	–	–	–	–	–	–	–
Project Creation Start Information	4.56	●	–	–	○	–	–	–
Information on Unmet Activity Needs	4.49	○	–	–	–	●	–	–
Project Progress Percentage Information	4.58	–	–	●	–	–	–	–
Project Status Repair/Correction Information	4.66	–	–	●	–	–	–	–
Company Experience Information	4.51	–	–	–	–	–	–	●
Status Information for Each Activity	3.83	–	–	●	–	–	–	–
Project Owner Name Information	4.47	–	○	–	●	–	–	–
Description of Project Needs Priority	4.68	–	–	–	–	○	–	–
Information on the number of clients	3.87	△	●	–	–	○	–	–
Portfolio/Team Profile Information	5.98	●	–	–	○	–	–	–
Contributions		264.95	175.62	187.59	140.34	161.92	105.39	75.72
Relative Contributions (%)		0.24	0.16	0.17	0.13	0.15	0.09	0.07
Ranking Technical Response Priority		1	3	2	5	4	6	7

Fig. 8. House of Quality
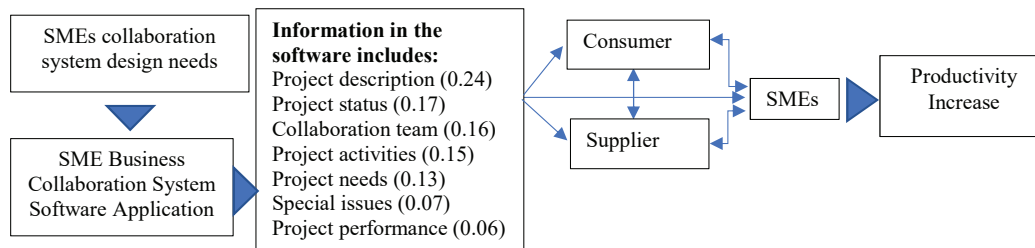
Fig. 9. Collaboration system application design

6. Discussion of the research results on technical response priority

Based on the results of identifying consumer needs, there are 20 attributes. The attributes needed to design a collaboration system are related to the identity of SMEs partners, suppliers, and customers. In addition to this information, there is also information about the activities and needs of SMEs partners, suppliers, and customers. Thus, 20 attributes will serve as a basis for meeting the need to design a business collaboration system. This follows from the table above, namely Table 2, regarding the Technical Response of the SMEs Collaboration System, where attributes range from X1 to X20.

There are seven attributes based on the results of the technical response carried out by the collaborative system design team. These attributes are the result of discussions with the collaborative system design team. The design team consists of an information technology (IT) team. These attributes aim to make it easier for SMEs to apply business collaboration systems. It is hoped that SMEs will have an uncomplicated design system because SMEs have limited ability to use information technology. This follows from the table above, namely Table 2, regarding the Technical Response of the SMEs Collaboration System, where there are seven technical responses.

There is a Technical Response Priority result based on the relationship between consumer needs and technical response. The design team will prioritize the design of the collaboration system based on the sequence. The order is Project Description, Project Status, Collaboration Team, Project Activities, Project Needs, Project Performance, and Special Issues. From this sequence, the collaboration system design team has the basis for creating a business collaboration software application. This application aims to increase the productivity and competitiveness of SMEs. This follows from the picture above, namely Fig. 8 about the House of Quality, where there is a Technical Response Priority Ranking.

This study has limitations on the attributes generated from the two methods, so these attributes cannot show the attribute categories desired by SMEs.

The weakness in this study is the determination of respondents, especially in the SME business sector. This study discusses different types of companies so that the attributes obtained are general or non-specific. In designing a collaboration system, it is expected to be able to understand.

This research can be developed by adding the Kano method, which categorizes the attributes desired by SMEs. The categories in the Kano method are Must-be requirements, One-dimensional requirements, Attractive requirements, Indifferent, Questionable, and Reverse.

7. Conclusions

1. There are 27 attributes of business collaboration desired by customers. Based on the service quality method, 20 variables have positive values.

2. There are five technical characteristics: project description, status, collaboration team, project activities, project needs, special issues, and project performance.

3. Based on the house of quality, project description (0.24), project status (0.17), collaboration team (0.16), project activities (0.15), project needs (0.13), special issues (0.07) and project performance (0.06) were selected as the proposed improvement and development following the priority of contribution in the QFD analysis. These attributes are prioritized in designing the SME collaboration system. Creating a collaboration system desired by SMEs can increase the productivity of SMEs.

Conflict of interest

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

Data availability

This research has related data in data storage. The available data are qualitative and quantitative.

References

1. Chuang, S.-H. (2020). Co-creating social media agility to build strong customer-firm relationships. Industrial Marketing Management, 84, 202–211. doi: https://doi.org/10.1016/j.indmarman.2019.06.012

2. Saura, J. R., Ribeiro-Soriano, D., Palacios-Marqués, D. (2021). Setting B2B digital marketing in artificial intelligence-based CRMs: A review and directions for future research. Industrial Marketing Management, 98, 161–178. doi: https://doi.org/10.1016/j.indmarman.2021.08.006

3. Sarangee, K., Schmidt, J. B., Srinath, P. B., Wallace, A. (2022). Agile transformation in dynamic, high-technology markets: Drivers, inhibitors, and execution. Industrial Marketing Management, 102, 24–34. doi: https://doi.org/10.1016/j.indmarman.2021.12.001

4. Setkute, J., Dibb, S. (2022). "Old boys' club": Barriers to digital marketing in small B2B firms. Industrial Marketing Management, 102, 266–279. doi: https://doi.org/10.1016/j.indmarman.2022.01.022

5. Sultana, S., Akter, S., Kyriazis, E. (2022). How data-driven innovation capability is shaping the future of market agility and competitive performance? Technological Forecasting and Social Change, 174, 121260. doi: https://doi.org/10.1016/j.techfore.2021.121260

6. Hadjielias, E., Christofi, M., Christou, P., Hadjielia Drotarova, M. (2022). Digitalization, agility, and customer value in tourism. Technological Forecasting and Social Change, 175, 121334. doi: https://doi.org/10.1016/j.techfore.2021.121334

7. Ahmed, A., Bhatti, S. H., Gölgeci, I., Arslan, A. (2022). Digital platform capability and organizational agility of emerging market manufacturing SMEs: The mediating role of intellectual capital and the moderating role of environmental dynamism. Technological Forecasting and Social Change, 177, 121513. doi: https://doi.org/10.1016/j.techfore.2022.121513

8. Sjödin, D., Parida, V., Kohtamäki, M., Wincent, J. (2020). An agile co-creation process for digital servitization: A micro-service innovation approach. Journal of Business Research, 112, 478–491. doi: https://doi.org/10.1016/j.jbusres.2020.01.009

9. Saragih, L. R., Dachyar, M., Zagloel, T. Y. M. (2021). Implementation of telecommunications cross-industry collaboration through agile project management. Heliyon, 7 (5), e07013. doi: https://doi.org/10.1016/j.heliyon.2021.e07013

10. Ghezzi, A., Cavallo, A. (2020). Agile Business Model Innovation in Digital Entrepreneurship: Lean Startup Approaches. Journal of Business Research, 110, 519–537. doi: https://doi.org/10.1016/j.jbusres.2018.06.013

11. Dabić, M., Stojčić, N., Simić, M., Potocan, V., Slavković, M., Nedelko, Z. (2021). Intellectual agility and innovation in micro and small businesses: The mediating role of entrepreneurial leadership. Journal of Business Research, 123, 683–695. doi: https://doi.org/10.1016/j.jbusres.2020.10.013

12. Behera, R. K., Bala, P. K., Rana, N. P., Kizgin, H. (2022). Cognitive computing based ethical principles for improving organisational reputation: A B2B digital marketing perspective. Journal of Business Research, 141, 685–701. doi: https://doi.org/10.1016/j.jbusres.2021.11.070

13. Moi, L., Cabiddu, F. (2021). An agile marketing capability maturity framework. Tourism Management, 86, 104347. doi: https://doi.org/10.1016/j.tourman.2021.104347

14. Srinivasan, M., Srivastava, P., Iyer, K. N. S. (2020). Response strategy to environment context factors using a lean and agile approach: Implications for firm performance. European Management Journal, 38 (6), 900–913. doi: https://doi.org/10.1016/j.emj.2020.04.003

15. Hagen, D., Risselada, A., Spierings, B., Weltevreden, J. W. J., Atzema, O. (2022). Digital marketing activities by Dutch place management partnerships: A resource-based view. Cities, 123, 103548. doi: https://doi.org/10.1016/j.cities.2021.103548

16. Bondar, S., Hsu, J. C., Pfouga, A., Stjepandić, J. (2017). Agile Digitale Transformation of Enterprise Architecture Models in Engineering Collaboration. Procedia Manufacturing, 11, 1343–1350. doi: https://doi.org/10.1016/j.promfg.2017.07.263

17. Al-Omoush, K. S., Simón-Moya, V., Sendra-García, J. (2020). The impact of social capital and collaborative knowledge creation on e-business proactiveness and organizational agility in responding to the COVID-19 crisis. Journal of Innovation & Knowledge, 5 (4), 279–288. doi: https://doi.org/10.1016/j.jik.2020.10.002

18. Shams, R., Vrontis, D., Belyaeva, Z., Ferraris, A., Czinkota, M. R. (2021). Strategic agility in international business: A conceptual framework for "agile" multinationals. Journal of International Management, 27 (1), 100737. doi: https://doi.org/10.1016/j.intman.2020.100737

19. Christofi, M., Pereira, V., Vrontis, D., Tarba, S., Thrassou, A. (2021). Agility and flexibility in international business research: A comprehensive review and future research directions. Journal of World Business, 56 (3), 101194. doi: https://doi.org/10.1016/j.jwb.2021.101194

20. Thomas, N. (2021). Towards agile knowledge management in an online organization. Procedia Computer Science, 192, 4406–4415. doi: https://doi.org/10.1016/j.procs.2021.09.217

21. Gonçalves, D., Bergquist, M., Alänge, S., Bunk, R. (2022). How Digital Tools Align with Organizational Agility and Strengthen Digital Innovation in Automotive Startups. Procedia Computer Science, 196, 107–116. doi: https://doi.org/10.1016/j.procs.2021.11.079

22. Lestantri, I. D., Janom, N. B., Aris, R. S., Husni, Y. (2022). The perceptions towards the digital sharing economy among SMEs: Preliminary findings. Procedia Computer Science, 197, 82–91. doi: https://doi.org/10.1016/j.procs.2021.12.121

23. Shariatmadari, M., Sarfaraz, A. H., Hedayat, P., Vadoudi, K. (2013). Using SWOT Analysis and Sem to Prioritize Strategies in Foreign Exchange Market in Iran. Procedia - Social and Behavioral Sciences, 99, 886–892. doi: https://doi.org/10.1016/j.sbspro.2013.10.561

24. Suhartini, S., Mahbubah, N. A., Basjir, M. (2021). Marketing strategy design based on information technology in batik small and medium-sized enterprises in Indonesia. Eastern-European Journal of Enterprise Technologies, 6 (13 (114)), 39–48. doi: https://doi.org/10.15587/1729-4061.2021.244137

25. Adhikara, M. A., Maslichah, Diana, N., Basjir, M. (2022). Organizational Performance in Environmental Uncertainty on the Indonesian Healthcare Industry: A Path Analysis. Academic Journal of Interdisciplinary Studies, 11 (2), 365. doi: https://doi.org/10.36941/ajis-2022-0058

26. Todeschini, B. V., Cortimiglia, M. N., de Medeiros, J. F. (2020). Collaboration practices in the fashion industry: Environmentally sustainable innovations in the value chain. Environmental Science & Policy, 106, 1–11. doi: https://doi.org/10.1016/j.envsci.2020.01.003

27. Chen, C., Zhang, S.-S., Yu, S.-H., Chu, J.-J., Chen, D.-K., Cun, W.-Z., Zhao, H. (2021). Research on group awareness of networked collaboration within the design team and between teams. Advanced Engineering Informatics, 49, 101347. doi: https://doi.org/10.1016/j.aei.2021.101347

28. Qian, X., Ma, Y., Feng, H. (2018). Collaboration space division in collaborative product development based on a genetic algorithm. Journal of Industrial Engineering International, 14 (4), 719–732. doi: https://doi.org/10.1007/s40092-018-0257-7

29. Zhang, X. (2017). User selection for collaboration in product development based on QFD and DEA approach. Journal of Intelligent Manufacturing, 30 (5), 2231–2243. doi: https://doi.org/10.1007/s10845-017-1386-3

30. Wu, C., Yan, B., Yu, R., Yu, B., Zhou, X., Yu, Y., Chen, N. (2021). RETRACTED ARTICLE: Digital forensics system based on dynamic path prediction and the competitiveness of cross-border e-commerce SMEs. Personal and Ubiquitous Computing, 25 (S1), 11–11. doi: https://doi.org/10.1007/s00779-021-01615-3

31. O'Regan, N., Ghobadian, A., Gallear, D. (2006). In search of the drivers of high growth in manufacturing SMEs. Technovation, 26 (1), 30–41. doi: https://doi.org/10.1016/j.technovation.2005.05.004

32. Grandón, E. E., Nasco, S. A., Mykytyn, P. P. (2011). Comparing theories to explain e-commerce adoption. Journal of Business Research, 64 (3), 292–298. doi: https://doi.org/10.1016/j.jbusres.2009.11.015

33. Qalati, S. A., Yuan, L. W., Khan, M. A. S., Anwar, F. (2021). A mediated model on the adoption of social media and SMEs' performance in developing countries. Technology in Society, 64, 101513. doi: https://doi.org/10.1016/j.techsoc.2020.101513

34. Tolstoy, D., Nordman, E. R., Hånell, S. M., Özbek, N. (2021). The development of international e-commerce in retail SMEs: An effectuation perspective. Journal of World Business, 56 (3), 101165. doi: https://doi.org/10.1016/j.jwb.2020.101165

35. Di Fatta, D., Patton, D., Viglia, G. (2018). The determinants of conversion rates in SME e-commerce websites. Journal of Retailing and Consumer Services, 41, 161–168. doi: https://doi.org/10.1016/j.jretconser.2017.12.008

36. Saridakis, G., Lai, Y., Mohammed, A.-M., Hansen, J. M. (2018). Industry characteristics, stages of E-commerce communications, and entrepreneurs and SMEs revenue growth. Technological Forecasting and Social Change, 128, 56–66. doi: https://doi.org/10.1016/j.techfore.2017.10.017