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Critical Success Factors of Multichannel Integration Quality: A Case In E-Commerce Integrated Chat Application

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ABSTRAK

Selama bertahun-tahun, internet telah hadir untuk memfasilitasi teknologi di berbagai sektor, salah satunya adalah ritel multisaluran. Internet memungkinkan banyak bisnis tradisional untuk berkembang menjadi peritel multisaluran dengan melengkapi penawaran toko mereka dengan saluran online untuk meningkatkan efisiensi operasional dan meningkatkan kepuasan pelanggan. Namun, hal ini menimbulkan kesenjangan bagi perusahaan yang ingin memulai perjalanan implementasi integrasi multisaluran mereka, di mana mereka harus memfokuskan sumber daya mereka untuk berhasil mengimplementasikan integrasi multisaluran. Penelitian ini bertujuan untuk menentukan faktor penentu keberhasilan (critical success factor/CSF) kualitas integrasi multichannel pada e-commerce dengan menggunakan metode Analytical Hierarchy Process (AHP) untuk analisis data. Penelitian ini dilakukan pada sebuah perusahaan yang menawarkan integrasi multichannel e-commerce. Penelitian ini dilakukan melalui studi literatur dan wawancara dengan dua orang pemangku kepentingan dari proyek integrasi multichannel e-commerce sebagai ahli untuk penelitian ini dan kemudian menyebarkan kuesioner kepada dua orang yang terlibat dalam proyek tersebut. Terdapat 14 faktor yang dievaluasi, yang terdiri dari tiga faktor yang berhubungan dengan konfigurasi layanan channel, dua faktor yang berhubungan dengan konsistensi konten, dua faktor yang berhubungan dengan konsistensi proses, tiga faktor yang berhubungan dengan jaminan, dua faktor yang berhubungan dengan timbal balik channel, dan dua faktor yang berhubungan dengan hubungan dengan pelanggan. Di antara 14 faktor tersebut, konsistensi sistem merupakan faktor yang paling penting, diikuti oleh keluasan pilihan saluran, konsistensi informasi, dan aksesibilitas pemulihan layanan.

Keywords:

critical success factor, multichannel integration quality, analytical hierarchy process, multichannel retailing

For many years, the internet has appeared to facilitate technology in many sectors, one of which is multichannel retailing. The internet allows many traditional businesses to develop into multichannel retailers by complementing their store offerings with online channels to improve operational efficiency and enhance customer satisfaction. However, this raises a gap for companies that want to start their multichannel integration implementation journey as to where to focus their resources for successfully implementing multichannel integration. This study aims to determine the critical success factor (CSF) of multichannel integration quality in e-commerce by using Analytical Hierarchy Process (AHP) method for data analysis. This study has been conducted on a company that offers e-commerce multichannel integration. This research is done through literature review and interviews with two stakeholders of e-commerce multichannel integration project as the expert for this research and then distribute the questionnaires to the two individuals involved in the project. There are 14 factors evaluated, consisting of three factors related to the channel service configuration, two factors related to the content consistency, two factors related to the process consistency, three factors related to the assurance, two factors related to channel reciprocity, and two factors related to customer relation. Among the 14 factors, the system consistency is the most important factor, followed by breadth of channel choice, information consistency, and service recovery accessibility

PENDAHULUAN

Nowadays, digital transformation has played a pivotal role in reshaping the landscape of businesses, propelling them to evolve rapidly. In response to this shift, businesses find themselves grappling with the necessity to effectively manage interactions with customers across various channels, a critical aspect of ensuring customer satisfaction (Rodríguez-López et al., 2024). The process through which these channels seamlessly merge into a unified application is referred to as multichannel integration. In order to realize the full potential of this integration, businesses must actively share product knowledge across different channels (Brynjolfsson et al., 2013). This becomes especially crucial due to the prevailing siloed structures in many businesses delivering multichannel services, where each channel operates independently, often resulting in fragmented customer experiences (Herhausen et al., 2015).

Researchers like Hsieh et al. have asserted that a well-implemented multichannel environment can not only enhance customer satisfaction but also contribute to increased customer retention and participation [4]. To address the intricate decision-making process in multichannel integration, the Analytic Hierarchy Process (AHP) emerges as a valuable methodology (Saaty, 1990). AHP provides a structured approach for decision-making, allowing businesses to systematically prioritize critical success factors (CSF). By employing AHP, companies can quantitatively evaluate and rank the importance of different factors, aiding in the strategic allocation of resources and enhancing the overall success of multichannel integration initiatives.

Recognizing the dynamic nature of e-commerce, there is an urgent need for businesses to conduct a comprehensive ranking of multichannel implementation across some aspects that we discuss later. The urgency stems from the growing competition and evolving consumer expectations in the e-commerce landscape As highlighted in Yusra's research, the projected growth to USD 11.1 billion signifies the robust potential of the omnichannel retail platform market on a global scale(Ganotakis & Lindsay, 2016). The increasing reliance on e-commerce and the pervasive use of mobile devices for commercial transactions underscore the urgency for businesses to strategically integrate multichannel platforms to remain competitive in this evolving landscape(Ganotakis & Lindsay, 2016). Businesses must harness the power of data-driven insights to guide their multichannel strategies and stay ahead in the highly competitive market.

While the prospect of multichannel integration holds promises of enhanced customer satisfaction, it simultaneously poses formidable challenges for companies embarking on this endeavor. Companies entering the realm of multichannel integration must recognize the substantial investment required for such projects . Pouring resources into inadequately formulated multichannel strategies and technologies may expose companies to the risk of poor return on investment (ROI). Therefore, it becomes imperative for companies to grasp the critical success factors (CSF) associated with multichannel integration before venturing into such projects. Critical success factors serve as a valuable guide in identifying the key elements essential for achieving success in multichannel integration. By prioritizing resources based on these factors, companies can significantly minimize the likelihood of failure and optimize their chances of success.

In literature reviews by Neslin et al (Neslin et al., 2006) and Neslin & Shankar (Neslin & Shankar, 2009), research on multichannel management in the private sector has been comprehensively systematized. The rise of various channels for customers to communicate with businesses has put traditional purchase processes based on a single interaction channel to the test (Neslin et al., 2006). According to Neslin et al.(Neslin et al., 2006), multichannel customer management is "The design, deployment, coordination, and evaluation of channels through which enterprises and customers engage, with the purpose of boosting customer value through effective customer acquisition, retention, and development." Face-to-face interactions in a store, the Internet, telephone via call centres, sales force, or third-party providers are often considered as channels (Neslin & Shankar, 2009). Multichannel customer management is a customer-centric marketing role aimed at boosting a company's income by putting the customer first. It is inextricably tied to multichannel customer behaviour. Multichannel customer behaviour deals with the elements that influence customers' channel choice and use, as opposed to customer multichannel management, which considers a company's perspective (Dalla Pozza, 2014).

After many years, the Internet appears to be more of a facilitating technology in many sectors, such as allowing business transactions to be conducted electronically over the internet, or what we commonly refer to as e-commerce. The internet allows traditional brick-and-mortar merchants to complement their store offerings with online channels, improve operational efficiency, and enhance customer advantages. These conventional businesses have developed into multichannel retailers who now dominate the online retailing industry. More than 80% of a diverse cross-section of U.S. retailers said they sell items through numerous platforms. All the large retailers and 94 percent of the "winners" (defined as the retailers with the highest

financial performance) were multichannel operators in a recent benchmark study performed by Kilcourse and Rowen (Kilcourse & Rowen, 2008). Studying the importance of factors affecting this multichannel integration quality can give useful insight for companies that want to offer multichannel integration service and also the merchants to choose the channel where to put their product.

The concept of "success factors" is briefly alluded to by Daniel (Daniel, 1961) in 1961. Rockart (Rockart, 1979) then refined the concept into critical success factors. Later on, Bullen and Rockart (Bullen & Rockart, 1981) illustrate CSFs as key areas that if they go right, business can flourish and also attain manager's goals. Dickinson et al (Dickinson et al., 1984) explain in detail that CSFs are something that require special attention because of its significance and a systematic approach to identify actions that must be taken including contingency plans. As a field that is relatively new, this study collects and analyses CSFs from numerous sources and articles in order for multichannel integration to have a good quality, so a firm can make priority towards channels that are more beneficial to be integrated first.

An argument that was stated by Chen et al. (Chen et al., 2021) stated that in order to achieve customer satisfaction, a firm can implement customer relationship management (CRM) systems to support its employees that work and provide services to customers in different channels. From that cause, this study identifies a new dimension to multichannel, named *customer relation.* From literature review that was done, this dimension can be derived into two factors, they are channel interactivity and communication effectiveness. *Channel interactivity* is the level of interaction that is initiated by a firm to customers and vice versa (Cui et al., 2022). Interaction through communication media, in respect of online channels, can influence consumer behavioral intentions (Cui et al., 2022). Fedyaeva et al. (Fedyaeva et al., 2021) stated that a well-developed communication scheme, in this case something to support c*ommunication effectiveness*, along with a well-established consumption system can have a positive impact on the number of completed transactions and also increase work efficiency. Their statement implies the importance of communication effectiveness in a CRM system, that affects each channel of integrated multichannel. They also stated that synchronization, integration, and automation of the communication process between channels plays an important part in the CRM system implementation. Cruz-Jesus et al. (Cruz-Jesus et al., 2019) discussed that a firm can implement a collaborative CRM system in order to manage and integrate communication between channels and also customer interaction touchpoints.

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With the aim of collecting and analyzing the data, the methods should represent the goals of the research. Therefore, quantitative research was done by handing online questionnaires to the respondents. The specifics of the data collection methodology would be described in this section. Also, the Analytical Hierarchy Process (AHP) would also be narrated in this section.

AHP Methodology

According to Fransesca (Abastante et al., 2019), AHP is a Multi-Criteria Decision Analysis (MCDA) method based on ratio scales for measuring performances on considered criteria and the importance of these criteria. Given n criteria, the Decision Maker (DM) is supported to provide a value for the evaluations g_(j) (a) (g_j∈G and a∈A) and for the weights w_1,...,w_n in a weighted sum aggregation. Using AHP, for each criterion g_j∈G, the DM is asked to compare each couple of alternatives {a_r,a_s} indicating the preferred alternative and expressing the degree of preference with a verbal judgment on a nine-point scale (Saaty, 1990) defined as:

a. 1: Indifferent
b. 3: Moderately Preferred
c. 5: Strongly Preferred
d. 7: Very Strongly Preferred
e. 9: Extremely Preferred

with 2, 4, 6 and 8 intermediate values between the two adjacent judgments. Denoting by a_rs^((j)) the pairwise comparison between the priorities e_r^((j)) and e_s^((j)), it is possible to build a positive square reciprocal matrix M(j) of order |A|:

$$M^{(j)} = \begin{pmatrix} 1 & a_{12}^{(j)} & \cdots & a_{1|A|}^{(j)} \\ 1/a_{12}^{(j)} & 1 & \cdots & a_{2|A|}^{(j)} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1|A|}^{(j)} & 1/a_{2|A|}^{(j)} & \cdots & 1 \end{pmatrix}$$

The basic idea is that if the comparative judgments are perfectly consistent, then a_rs^((j))=(e_r^((j)))/(e_s^((j)))) so that, the condition a_rs^((j)) a_sk^((j))=a_rk^((j)) is satisfied for all r,s,k. In this case, computing the e_r^((j)) for r=1,…,|A|, one has e(j) = a(j),r = 1,...,|A|.
However, in general, the comparative judgments of matrix M_((j)) are inconsistent and, therefore, several procedures have been proposed to determine the evaluations e_((j)) and among them the r most well-known are based on the computation of the right eigen-vector of the M_((j)) matrix (Saaty, 1977), the row arithmetic mean vector, that is

$$e_r^{(j)} = \frac{\sum_{s=1}^{|A|} a_{rs}^{(j)}}{|A|}$$

and the row geometric mean vector [45], that is.

$$e_r^{(j)} = \sqrt[|A|]{\prod_{s=1}^{|A|} a_{rs}^{(j)}}.$$

To apply the AHP methods, firstly the AHP model is divided into three parts, they are Goals, Dimension, and Factors. The goal in this case is the successful Multichannel Integration Quality in E-Commerce Integrated Chat Application. For the dimension, it is filled with the criteria of the conceptual model based customized framework obtained from the literature review, while the factors are filled with the element that are on each dimension.

Second, each dimension and factor will be compared with each other in each domain using the AHP Pairwise comparison method to determine the level of importance. For example, in the Assurance dimension, there are three factors, they are Privacy, Security, and Service Recovery Accessibility which will be compared with one another.

Finally, the results of these comparisons will use Assurance criteria to be compared with other dimensions which also perform similar comparisons against the existing factors in the dimensions. Therefore, we could obtain the aggregate ranks of importance of every factor. The ranks will determine the overall level of importance of the model.

Data Collection

Data collection for this research would be quantitative data in the form of a questionnaire. The questionnaire contains a list of questions with a nine-point scale as the suggested answers. The participants were educated on how to validly answer the questions before proceeding to the questionnaire. The nine-point scale questions were used for indicating the pairwise comparison between the dimensions and factors.

The subject of the questionnaire was the stakeholders of the E-Commerce Integrated Chat Application development. The questionnaire was sent electronically to the respondents using emails with a cover letter on it. The cover letter was intended to describe the purpose of the research. The participants were given a time limit of one week to fill the questionnaire.

The questionnaire was made on a Google Forms application based on figure 1. The result of the questionnaire can be shown and exported into Google Spreadsheet application. The results of the answers would then be used for conducting the AHP analysis.

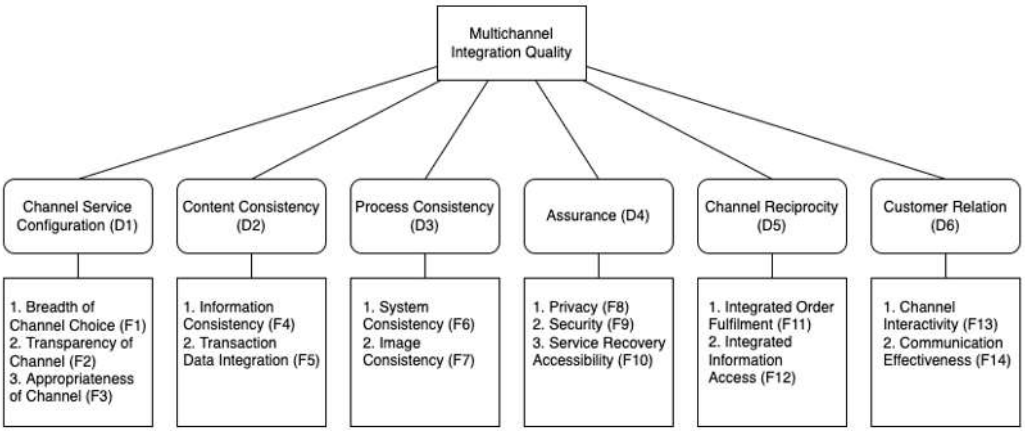

Figure 1. Proposed CSFs of Multichannel Integration Quality Framework

HASIL DAN PEMBAHASAN

This section shows the result and processing of the data gathered in the form of matrix tables, alongside with the analysis of each table.

Table 1. All Dimension Matrix

	D1	D2	D3	D4	D5	D6
D1	1	3,5	0,5	5	2	4
D2	0,2857	1	0,4	4	3	5
D3	2	2,5	1	6,5	4,5	5,5
D4	0,2	0,25	0,1538	1	3,5	3,5
D5	0,5	0,3333	0,2222	0,2857	1	0,5
D6	0,25	0,2	0,1818	0,2857	2	1

In Table 1, there are six dimensions included, they are Channel Service Configuration (D1), Content Consistency (D2), Process Consistency (D3), Assurance (D4), Channel Reciprocity (D5), and Customer Relation (D6), where the assigned value of each column was gained by averaging all the respondents' answers to the respective questions. The data then would be proceeded to calculate the normalized value to gain all dimension eigenvalues.

Table 2. All Dimension Normalized Matrix

	D1	D2	D3	D4	D5	D6	Dimension eigenvalue
D1	0,2361	0,4497	0,2034	0,2929	0,1250	0,2051	0,2520
D2	0,0675	0,1285	0,1627	0,2343	0,1875	0,2564	0,1728
D3	0,4722	0,3212	0,4069	0,3808	0,2813	0,2821	0,3574
D4	0,0472	0,0321	0,0626	0,0586	0,2188	0,1795	0,0998
D5	0,1180	0,0428	0,0904	0,0167	0,0625	0,0256	0,0594
D6	0,0590	0,0257	0,0740	0,0167	0,1250	0,0513	0,0586

After implementing normalization to each dimension in Table 1, the weight of each dimension represented by eigenvalue can be gained in Table 2. Dimension eigenvalues of D1 to D6 can be obtained by averaging each dimension's pairwise. The result of D1 to D6 dimension eigenvalues are 0,2520, 0,1728, 0,3754, 0,0998, 0,0594, and 0,0586 respectively.

Table 3. Channel Service Configuration Matrix

	F1	F2	F3
F1	1	4,5	5,5
F2	0,2222	1	3
F3	0,1818	0,3333	1

In Table 3, there are three factors included from Channel Service Configuration dimension (D1), they are Breadth of Channel Choice (F1), Appropriateness of Channel (F2), Transparency of Channel (F3), where the assigned value of each column was gained by averaging all the respondents' answers to the respective questions. The data then would be proceeded to calculate the normalized value to gain all dimension eigenvalues.

Table 4. Channel Service Configuration Normalized Matrix

	F1	F2	F3	Factor Eigenvalue
F1	0,7122	0,7714	0,5789	0,6875
F2	0,1583	0,1714	0,3158	0,2152
F3	0,1295	0,0571	0,1053	0,0973

After implementing normalization to factors of Channel Service Configuration dimension in Table 3, the weight of each factor represented by eigenvalue can be gained in Table 4. Factor eigenvalues of F1 to F3 can be obtained by averaging each factor's pairwise. The result of F1 to F3 factor eigenvalues are 0,6875, 0,2152, and 0,0973 respectively.

Table 5. Content Consistency Matrix

	F4	F5
F4	1	4,5
F5	0,2222	1

In Table 5, there are two factors included from Content Consistency dimension (D2), they are Information Consistency (F4) and Transaction Data Integration (F5), where the assigned value of each column was gained by averaging all the respondents' answers to the respective questions. The data then would be proceeded to calculate the normalized value to gain all dimension eigenvalues.

Table 6. Content Consistency Normalized Matrix

	F4	F5	Factor Eigenvalue
F4	0,8182	0,8182	0,8182
F5	0,1818	0,1818	0,1818

After implementing normalization to factors of Content Consistency dimension in Table 5, the weight of each factor represented by eigenvalue can be gained in Table 6. Factor eigenvalues of F4 and F5 can be obtained by averaging each factor's pairwise. The result of F4 and F5 factor eigenvalues are 0,8182 and 0,1818 respectively.

Table 7. Process Consistency Matrix

	F6	F7
F6	1	5,5
F7	0,1818	1

In Table 7, there are two factors included from Process Consistency dimension (D3), they are System Consistency (F6) and Image Consistency (F7), where the assigned value of each column was gained by averaging all the respondents' answers to the respective questions. The data then would be proceeded to calculate the normalized value to gain all dimension eigenvalues.

Table 8. Process Consistency Normalized Matrix

	F6	F7	Factor Eigenvalue
F6	0,8462	0,8462	0,8462
F7	0,1538	0,1538	0,1538

After implementing normalization to factors of Process Consistency dimension in Table 7, the weight of each factor represented by eigenvalue can be gained in Table 8. Factor eigenvalues of F6 and F7 can be obtained by averaging each factor's pairwise. The result of F6 and F7 factor eigenvalues are 0,8462 and 0,1538 respectively.

Table 9. Assurance Matrix

	F8	F9	F10
F8	1	0,2	0,2857
F9	5	1	0,2857
F10	3,5	3,5	1

In Table 9, there are three factors included from Assurance dimension (D4), they are Privacy (F8), Security (F9), Service Recovery Accessibility (F10), where the assigned value of each column was gained by averaging all the respondents' answers to the respective questions. The data then would be proceeded to calculate the normalized value to gain all dimension eigenvalues.

Table 10. Assurance Normalized Matrix

	F8	F9	F10	Factor Eigenvalue
F8	0,1053	0,0426	0,1818	0,1099
F9	0,5263	0,2128	0,1818	0,3070
F10	0,3684	0,7447	0,6364	0,5832

After implementing normalization to factors of Assurance dimension in Table 9, the weight of each factor represented by eigenvalue can be gained in Table 10. Factor eigenvalues of F8 to F10 can be obtained by averaging each factor's pairwise. The result of F8 to F10 factors eigenvalue are 0,1099, 0,3070, and 0,5832 respectively.

Table 11. Channel Reciprocity Matrix

	F11	F12
F11	1	5
F12	0,2	1

In Table 11, there are two factors included from Channel Reciprocity dimension (D5), they are Integrated Order Fulfilment (F11) and Integrated Information Access (F12), where the assigned value of each column was gained by averaging all the respondents' answers to the respective questions. The data then would be proceeded to calculate the normalized value to gain all dimension eigenvalues.

Table 12. Channel Reciprocity Normalized Matrix

	F11	F12	Factor Eigenvalue
F11	0,8333	0,8333	0,8333
F12	0,1667	0,1667	0,1667

After implementing normalization to factors of Channel Reciprocity dimension in Table 11, the weight of each factor represented by eigenvalue can be gained in Table 12. Factor eigenvalues of F11 and F12 can be obtained by averaging each factor's pairwise. The result of F11 and F12 factor eigenvalues are 0,8333 and 0,1667 respectively.

Table 13. Customer Relation Matrix

	F13	F14
F13	1	0,2222
F14	4,5000	1

In Table 13, there are two factors included from Customer Relation dimension (D6), they are Channel Interactivity (F13) and Communication Effectiveness (F14), where the assigned value of each column was gained by averaging all the respondents' answers to the respective questions. The data then would be proceeded to calculate the normalized value to gain all dimension eigenvalues.

Table 14. Customer Relation Normalized Matrix

	F13	F14	Factor Eigenvalue
F13	0,1818	0,1818	0,1818
F14	0,8182	0,8182	0,8182

After implementing normalization to factors of Customer Relation dimension in Table 13, the weight of each factor represented by eigenvalue can be gained in Table 14. Factor eigenvalues of F13 and F14 can be obtained by averaging each factor's pairwise. The result of F13 and F14 factor eigenvalues are 0,1818 and 0,8182 respectively.

Table 15. CSF Summary Matrix

Dimension	Dimension eigenvalue	Factor	Factor eigenvalue	Factor weight	Rank
D1	0,2520	F1	0,6875	0,1733	2
		F2	0,2152	0,0542	6
		F3	0,0973	0,0245	11
D2	0,1728	F4	0,8182	0,1414	3
		F5	0,1818	0,0314	9
D3	0,3574	F6	0,8462	0,3024	1
		F7	0,1538	0,0550	5
D4	0,0998	F8	0,1099	0,0110	12
		F9	0,3070	0,0306	10
		F10	0,5832	0,0582	4
D5	0,0594	F11	0,8333	0,0495	7
		F12	0,1667	0,0099	14
D6	0,0586	F13	0,1818	0,0107	13
		F14	0,8182	0,0480	8

After all the dimensions and factors have been analysed, the weight of each factor can be gained by multiplying factor eigenvalue to the respective dimension eigenvalue. System Consistency factor (F6) from Process Consistency dimension (D3) has the highest weight value while Integrated Information Access factor (F12) from Channel Reciprocity Dimension (D5) has the lowest weight value globally.

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From the analysis, we can conclude the most important factors of E-Commerce Integrated Chat Application multichannel integration quality. The analysis shows that System Consistency is the most important factor among the other overall thirteen factors analyzed in the study. Therefore, the consistency delivered service and the potential issues of the channel adopted by the system serves as the most important factor of the multichannel integration quality. We may also conclude several things to note such as the important factors of each dimension. On the Channel Service Configuration (D1), the breadth of channel coise emerges as the most important factor among the other factors. The selection of the channel may be critical to the multichannel integration quality. Information Consistency also emerges as the most important factors in the Content Consistency (D2) dimension. Also follows: service recovery accessibility, integrated order fulfillment, and communication effectiveness factors play an important role in Assurance (D4), Channel Reciprocity (D5), and Customer Relation (D6) Dimension respectively. However, It must be taken into consideration that the analyzed factors and framework were added from the earlier studies that were reviewed and modified further based on the literature review and current condition of the subject of study. The study limits the factors and dimensions into the aforementioned framework. Different factors may lead to different outcomes of the analysis.

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