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An Integrated E-Service Quality, IPA, and IT Business Value Framework for Evaluating Flexible-Workforce Digital Payroll Systems in F&B

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Abstract.
Purpose: The digital transformation in food and beverage (F&B) industry has become massive movement, including the payroll processes. Previous research on innovation adoption behaviors only focusses on service quality and satisfaction that does not provide tangible added value to employees, particularly through the gap between their actual experience and initial expectations of the innovation. This phenomenon is more challanging with F&B chains with multiple outlets with employees the flexibility to choose their own shifts. This study offers a proposed framework that divided into multi layers, e-service quality gap analysis, Importance-Performance Analysis (IPA), and an assessment of IT business value, specifically within the context of adopting digital payroll features in the F&B sector.
Methods/Study design/approach: This study uses a quantitative approach on a single case, a food and beverage (F&B) business with multiple outlets. Data respondent collections were collected in between April and August 2026, divided into 3 steps, there are response the expectation, the satisfaction, and the perceived value of IT within the business. From a total population of 72 employees, 23 part-time staff were obtained, which could be linked across all stages of the study's analytical method. The analysis used validity and reliability tests, gap analysis with the Wilcoxon signed-rank test, IPA with stated and derived importance, and Pearson and Spearman correlation with Holm correction.
Result/Findings: All seven dimensions have negative gaps, with an average of −0.36. Four dimensions remained significant after corrections were applied. In terms of the gap and IT business value, Reliability dimension stands out as the most prominent, being the only dimension located in the “Concentrate Here” quadrant. Based on stated importance, the Fulfillment dimension falls into the “Low Priority” quadrant; however, it shows a strong correlation with IT business value (r = 0.891) and shifts to the “Concentrate Here” quadrant when analyzed using derived importance.
Novelty/Originality/Value: Based on all layer’s show the Reliability dimension must be prioritized. The correlation layer also shows a priority, Fulfillment, that IPA alone does not show. This study gives a three-layer framework to evaluate digital administrative systems for flexible, multi-location workforces. The sample is small and comes from one case. So, the results are an example of the framework, not a confirmation of it.

Keywords: E-service quality, Importance-performance analysis, IT business value, Digital payroll system, Flexible workforce
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INTRODUCTION

Digital transformation in the food and beverage (F&B) industry is not only on the customer side, but such also as ordering and payment [1], [2]. Some researchers employ the concept of electronic service quality (e-service quality) to evaluate such internal systems. Previous studies have examined innovation users, encompassing not only customers but also employees [5], [6], [7]. In the context of innovation adoption within the food and beverage (F&B) industry, digital payroll systems are implemented to replace manual processes. Key challenges include the risks of calculation errors, payment delays, and the absence of historical records for pay slips [3], [8]. Digital payroll schemes offer the potential for faster, more accurate processes that are also more accessible to employees [4], [9].

However, this study has purpose to explore how the benefits provide tangible value with F&B chains as the study case, where the employee has the flexibility on their work schedules. Previous study shows the

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flexible in working is widely adopted, including the service sector [10]. Research shows that the level of freedom to manage their own work is the truly benefits employees [11]. Furthermore, its impact depends on whether this flexibility is formally regulated or the agreement with a supervisor only [12]. Trust in workplace systems is built on users' experiences when interacting with those systems [13]. Therefore, a reliable and transparent payroll system is even more important for flexible workers [8], [9]. For example, a barista who works at three different locations in a single week cannot ask the same supervisor the same question every time their paycheck appears to be incorrect [14].

The researchers identified several relevant studies, start with the group used an analysis of the gap between expectations and satisfaction. This approach is derived from SERVQUAL and its electronic version, E-S-QUAL [15]. Previous study shown a service quality approach can be used to evaluate IT services [16]. Gap analysis still has limitations because the gap's score does not indicate which dimensions should be given top priority. Therefore, the next group adds Importance-Performance Analysis (IPA), which was introduced by Martilla and James [17]. Rafi et al. combined e-SERVQUAL and IPA for a university application [7]. Lu et al. combined SERVQUAL and IPA in an intensive care unit [18], and Ayhan et al. combined E-GovQual and IPA for e-government services [19]. These combined studies give the most practical recommendations. But they stop at a priority list. They do not check whether the priority dimensions affect an outcome. The third group uses the DeLone and McLean IS Success Model [20]. Al-Okaily and Al-Okaily [21] and G.C. et al. [22] showed that satisfaction is related to individual and organizational net benefits. However, this group does not rank the service dimensions. Based on our search, none of these groups studied a payroll system for flexible, multi-location workers [23].

So, some researchers focus on gap analysis and IPA, and others focus on satisfaction and net benefits. Only a few studies connect the priority of each dimension with perceived IT Business Value. We did not find such a study for payroll systems in a flexible workforce. Therefore, this research proposes an evaluation framework with three layers. Gap analysis between expectation and satisfaction for seven e-service quality dimensions is the first layer. The second layer is IPA to find the priority areas. The third layer is correlation between satisfaction on each dimension and a composite score of IT Business Value. The proposed framework can be used for administrative processes, with flexibility in rotating workers. In this study, the proposed framework is applied for a F&B business payroll system with multiple outlets.

Therefore, the objectives of this study are divided into: (1) evaluating a digital payroll system using seven dimensions of e-service quality, (2) determining the priority dimensions that require improvement first, and (3) measuring the strength of the relationship between satisfaction with each dimension and the perceived IT business value.

Digital Payroll Systems and the Flexible Workforce: An Emerging Issue

Many F&B businesses in Indonesia already use digital technology, especially micro and small businesses that want to compete with limited resources [1], [24]. Examples are QR-code self-ordering, Point of Sale (PoS) systems, and automatic stock records. These tools reduce mistakes from manual work [2]. Digital transformation in food MSMEs of Indonesia is primary driven by perceived ease of use and the owner's decision. This is also refered to improve operation and marketing performance [1]. Another study show Indonesian MSMEs adoption process is influencing the efficiency and sustainable performance but still face problems, such as limited resources and lack of individual skills [24].

Employee management process that included are recruitment, performance evaluation, and compensation. It influences organizational stability as well as employee well-being [8]. Human resource information systems have addressed many personnel-related issues from the past. These systems integrate various manual tasks such as recruitment, training, appraisal, and compensation into one automatic system [9]. Payroll is one such function, and several studies have specifically focused on payroll systems [3], [4].

Payroll process is early innovation in F&B sector if comparing with other common innovation such as PoS. Most payroll studies were done in other sectors or multi-nation companies [3], [8]. Small F&B businesses with informal management are rarely researched. Furthermore, many service businesses use flexible staffing, where workers choose their own schedule and location. Most payroll studies assume that employees work in one fixed place [3], [9]. When employees choose where and when they work, the payroll system must serve people who are less supervised and more spread out [12].

Extending E-Service Quality and IPA Toward IT Business Value

Gap analysis between expectation and satisfaction is a common way to evaluate a digital system in information systems research [5], [16]. In mobile banking, reliability, privacy, and security affect user satisfaction [25]. In e-government, fulfillment, security, and trustworthiness affect perceived value and satisfaction [6], [26], [27]. Employees can also be treated as customers. The internal service quality tradition sees employees as internal customers, and their satisfaction with company services affects their work performance [28]. Studies that use the DeLone and McLean model in e-governance also show that system and service quality affect satisfaction and net benefits [22]. This study uses seven dimensions from E-S-QUAL and its recovery scale, E-RecS-QUAL [15]. These dimensions were also used to evaluate administrative and IT services [7], [16]. Efficiency is how easy and fast employees can open and use the system. This is important because staff log in from different outlets. Fulfillment is whether the system gives accurate and on-time results as promised. In this study, pay is calculated based on shift data from all outlets, and all this data need to be reliable for the calculation process. Reliability is the system's ability to always operate without errors. Employees who rotate through various locations use this system under varying conditions, making it easier for them to detect errors. Privacy refers to the protection of personal data and payroll data at each location. Responsiveness refers to how quickly complaints and requests for corrections are addressed. This becomes more challenging when the on-site manager changes with each shift. Compensation refers to fair resolution when errors occur. Here, pay is calculated per shift and per outlet, so errors can occur frequently. Contact refers to the availability of support channels. For a workforce spread across many locations, these processes replace conventional approach that need to direct permission [29].

The four-quadrant Importance-Performance Analysis (IPA) was developed by Martilla and James as a decision-making tool [17]. Today, IPA is often applied in conjunction with gap analysis in case studies of digital platforms. Examples are university information systems [7], healthcare [18], and citizen e-services with E-GovQual [19]. IPA is also used in tourism destinations [30] and airport passenger experience [31]. IPA has two known problems. First, stated importance is often too high. Second, the position of the crosshairs changes the result. So, researchers must report the crosshair rule they use [30], [32]. In most studies, gap analysis and IPA end with a list of priorities. The studies do not continue to the effect on the organization [33].

This study continues the e-service quality and IPA results [7], [18] to IT Business Value. The theory comes from the DeLone and McLean IS Success Model [20]. In this model, individual net benefit comes after user satisfaction and before organizational benefit [23]. Al-Okaily and Al-Okaily found that satisfaction predicts individual impact, and individual impact predicts organizational impact [21]. Schweikl and Obermaier explain that IT creates value only when it is combined with other resources in the organization and used in daily work [34]. Only a few e-service quality or IPA studies test this link directly [33], [19]. This study uses this opportunity.

In this study, IT Business Value has four sub-constructs. The first is Efficiency Impact. It means the system helps employees finish and plan their work, including planning their shifts in different outlets. This sub-construct comes from perceived usefulness in the Technology Acceptance Model, which has been used for HR technology [35]. The second is Trust Impact. It means employees believe that the information in the system is accurate and not changed by other people. This is important when employees cannot meet a supervisor to check their records. Trust Impact is based on trust theory. Previous research has shown that salary transparency is associated with trust and motivation [36].

The third one is Flexibility Support, indicating how much the system helps the employee in controlling where and when to work. This is based on the flexible work literature and the autonomy over schedules literature emphasizing the linkage between the ability to control one's schedules and wellbeing [10], [11]. These studies showed that fair procedures are more important under low autonomy. Thus, fair compensation procedures are important even for those employees who know how to set their schedules. The fourth dimension is Impact on Commitment and/or Retention. This implies that the system is fair and transparent to the commitment of the employees. Part-time workers, in this respect, are employed using short-term renewable contracts. Hospitality frontline workers also have a tendency of quitting their jobs [38], [39]. Lin and Guo found that trust in the organization can predict the intention to remain employed [40]. Fair procedures with pay transparency are also associated with a reduced likelihood of employees leaving the company [41], [37].

Proposed Conceptual Framework

Based on the literature above, this study proposes the conceptual framework in Fig. 1. The framework connects three areas that are usually studied separately. The first link is from the seven e-service quality dimensions to gap analysis and IPA. Gap analysis and IPA are rarely used together, although each one covers the weakness of the other. Gap analysis shows how big the unmet expectation is. IPA shows which gap is most important for users. Lu et al. combined SERVQUAL gap analysis and IPA in healthcare, and the result gave more useful information to managers than one method only [18].

The second link is from the gap and IPA results to IT Business Value. This link follows the DeLone and McLean IS Success Model. In this study, the individual impact construct is replaced by IT Business Value. It has four parts: Efficiency Impact, Trust Impact, Flexibility Support, and Commitment/Retention Impact. These parts are chosen for a payroll system in a flexible workforce.

Each link in this framework already has support from previous studies. But we did not find a study that puts the three links together for a digital payroll system in a flexible workforce. This is the reason this study proposes the framework.

The framework is proposed to evaluate digital administrative systems for flexible, multi-location workforces. In this paper, it is applied to a digital payroll system in the F&B sector. The details are in the Method section.

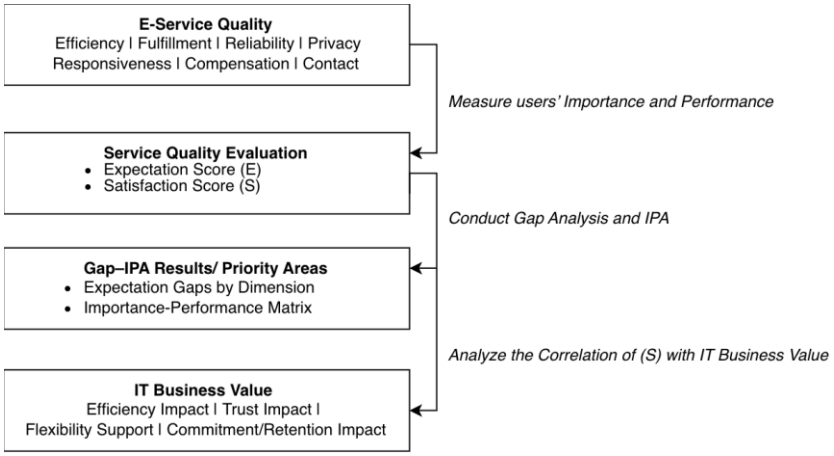


Figure 1. Proposed conceptual framework integrating E-service quality, Gap-IPA analysis, and IT business value

METHODS

Research Object and Design

The object of this study is a micro and small F&B business. In this paper it is called XYZ Coffee Shop. The business started in mid-2023 and has four outlets with more than 30 coffee and non-coffee menus. Three outlets are dine-in shops, and one outlet is a mobile outlet. The company started with digital services for customers, such as QR-code self-ordering. Since October 2024, it uses one integrated system for PoS and staff management. The digital payroll module is a new sub-application within the system. This module was added in May 2026 and is the subject of this evaluation. Thus, at the time satisfaction levels were measured, the respondents had been using the payroll module for about two months. They had been using the main system for much longer.

This study employs a quantitative, single-case approach. This case involves a unique situation where part-time staff have the flexibility to choose their own schedules across outlets. It was selected because it features both a self-scheduling system and a digital payroll system. This combination is still rarely found in payroll studies within the F&B sector. This case is used to demonstrate how the framework functions; it is not used to statistically test the framework.

The research steps are shown in Figure 2. Expectation data was collected before the payroll module was added. Satisfaction and IT Business Value data were collected after employees began using it. Thus, all layers of the framework use the same respondents.

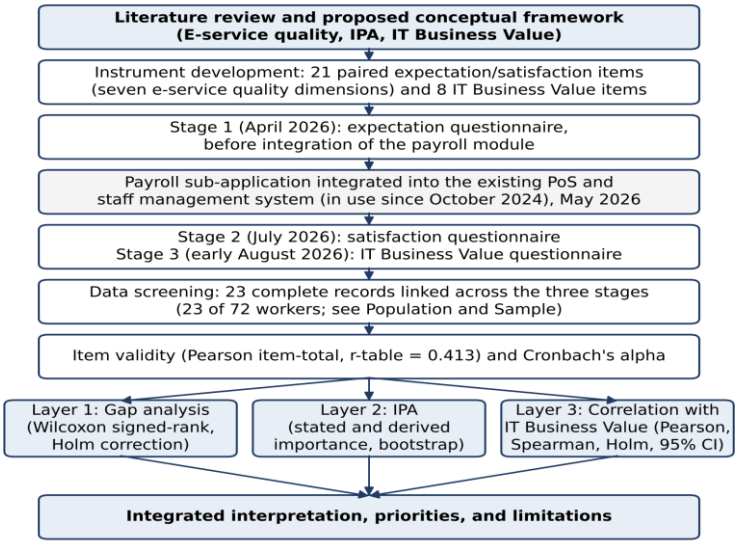


Figure 2. Research flowchart

Population and Sample

The study includes the employees at XYZ Coffee Shop that deploys a digital system to manage payrolls. At the time of the study, there were 72 employees at XYZ Coffee Shop. The number of active staff typically ranges from 70 to 80 due to turnover, given that most employees work part-time. Each outlet runs two or three shifts each day. Employees pick their own days to work and where they work from. A head barista makes sure that every scheduled time slot at each store is covered every month.

This study focused on workers with part-time contracts of 3-6 months that could be renewed. The head barista was responsible for scheduling, and therefore not included in the study. There were 23 full linked records from all three phases included in the analysis. This accounts for 32% of the population. The records are not a random sample, so there may be a sample bias.

Research Instrument

This study uses two questionnaires. Both were created following the same general rules for writing scale items [42]. The first questionnaire checks seven different aspects of e-service quality. Each indicator includes two statements, one that shows what is expected and another that shows what leads to satisfaction. This is in line with E-S-QUAL [15] and other research [18], [19]. The code X1.k is the expectation statement and X2.k is the satisfaction statement for item “k” in dimension “X”. For example, E1.2 and E2.2. The second questionnaire asks about the four parts of IT Business Value, and each part has one statement. All items use a five-point Likert scale, where 1 means strongly disagree and 5 means strongly agree [6], [21]. The complete questionnaire along with the anonymous responses from the 23 participants are included as additional materials.

Table 1. E-service quality questionnaire design

Dimension	Code	Satisfaction Statement (sample item)
Efficiency	E2.2	I can easily understand the system's interface and navigation.
Efficiency	E2.3	I can obtain my salary information quickly without difficulty.
Fulfillment	F2.1	I always receive pay consistent with what the system indicates.
Fulfillment	F2.3	I always receive my payslip on time according to the set period.
Reliability	RE2.1	I feel the payroll system is always reliable in providing salary information.
Reliability	RE2.2	I rarely experience errors in the salary calculations shown in the system.
Reliability	RE2.3	I feel my salary data in the system is always updated correctly and on time.
Privacy	P2.2	I am confident my salary information remains secure and cannot be manipulated by others.
Privacy	P2.3	I am confident the payroll system protects my personal data well.
Responsiveness	RS2.1	I can easily report problems or issues related to my salary.

Responsiveness	RS2.2	I feel the payroll system administrators respond to my issues quickly.
Responsiveness	RS2.3	I feel technical issues in the system are resolved within a reasonable time.
Compensation	CP2.2	I can request salary corrections through a clear and transparent process.
Compensation	CP2.3	I feel the payroll system provides certainty in handling my salary issues.
Contact	CT2.1	I can easily contact HR or admin if there is a problem with my salary.
Contact	CT2.2	I receive the assistance I need when experiencing issues with the payroll system.
Contact	CT2.3	I feel the responsible party is always ready to help when I experience problems with the system.

Note: Only the satisfaction versions of the 17 items retained after validity testing are shown. The excluded pairs (E1.1/E2.1, F1.2/F2.2, P1.1/P2.1, and CP1.1/CP2.1) are reported in Table 3.

Table 2. IT business value questionnaire design

Sub-construct	Code	Statement
Efficiency Impact	BV1	The payroll system helps me complete my work more efficiently.
Efficiency Impact	BV2	With this system, I can plan my work schedule better.
Trust Impact	BV3	I believe my fee calculation is accurate even though I work across different outlets.
Trust Impact	BV4	Transparency in the payroll system increases my trust in the company.
Flexibility Support	BV5	This system makes it easy for me to work at any outlet according to my chosen schedule.
Flexibility Support	BV6	This system supports my flexibility in choosing my working days and location.
Commitment/Retention Impact	BV7	The transparent payroll system makes me comfortable working under this flexible arrangement.
Commitment/Retention Impact	BV8	I feel more loyal to the company because of a fair and transparent payroll system.

Note: BV7 was excluded after validity testing (Table 6); Commitment/Retention Impact is therefore represented by BV8 only.

Data Collection Period

Even the collecting data is direct visit, for the answers of response were filled on the Google form. It was conducted in April 2026 prior to the introduction of the payroll module. Then the respondents indicated what they expected to be the added payroll features in the system they used. This sequence was due to the gap logic of expectation before use and perception after use [15]. Starting in May 2026, the payroll module was used. In July 2026, after about two months of use of this module, the same set of items in the satisfaction questionnaire was given. Answers from the IT Business Value Questionnaire were collected a few days later, at the beginning of August 2026, from the same respondents. Responses from all three stages were matched using respondent names. The names were deleted after matching.

Ethical Considerations

THE XYZ Coffee Shop owner agreed to this study and to the use of brand and outlet pseudonyms. Prior to the first stage, the respondents received a short briefing from the researchers. During this briefing, the respondents were told the purpose of the study and that participation was voluntary and that all answers were confidential. Verbal informed consent was obtained in this briefing. This study was not reviewed by a formal institutional ethics review board. It was a non-interventional survey among low-risk adults. The study followed the principles of confidentiality, consent, and voluntary participation outlined in the Helsinki Declaration [43]. Names were used only for matching the three stages and deleted before analysis. Only gender was retained for the respondent profile.

Data Analysis Techniques

Validity was evaluated by Pearson correlation of each item with the total score of its questionnaire version (expectation or satisfaction). This item-total method is an established one in scale development [42]. The r-table at 5% significance level for $n = 23$ ($df = 21$) is 0.413. If any (version of) items were below this, then the items (in versions) were deleted. This rule has been applied in previous work on e-service quality [16, 44]. Cronbach's alpha was used to analyze the reliability. Values > 0.8 are good, 0.6-0.8 are acceptable, and ≤ 0.6 are unreliable [42].

First, the expectation and satisfaction scores were described with mean and standard deviation. Then the gap of each dimension was calculated as mean satisfaction minus mean expectation, following the

SERVQUAL gap [15], [19]. A negative gap means the service is lower than expected. Service quality was also calculated as mean satisfaction divided by mean expectation [44]. A ratio below 1 means the expectation is not met. The data are ordinal and paired, so the gap was tested with the Wilcoxon signed-rank test. The paired t-test and the standardized mean difference (d_z) were also reported. The Holm correction was used for the seven dimensions. To check the ceiling effect, we counted the percentage of answers with the highest score.

IPA followed the quadrant method of Martilla and James [17], as used in other service quality studies [18], [44]. The mean expectation of each dimension (importance) was plotted against its mean satisfaction (performance). Expectation was used as importance because, in SERVQUAL, expectation shows the service level that users want [15]. Both axes also come from the same items. But expectation and importance are not exactly the same, and stated ratings are often too high [32]. So, a second grid was made with derived importance. In this grid, the importance of each dimension is its correlation with IT Business Value [30]. The crosshairs were placed at the grand mean of expectation (E) and satisfaction (S) for the seven dimensions, as shown in (1) and (2).

$$\mathrm{E_{avg}} = \frac{(\sum \mathrm{E_j})}{m} \tag{1}$$

$$\mathrm{S_{avg}} = \frac{(\sum \mathrm{S_j})}{m} \tag{2}$$

where E_{avg} and S_{avg} are the grand means of expectation and satisfaction, E_j and S_j are the mean expectation and satisfaction of dimension j, and m is the number of dimensions. The grid has four quadrants. They are Concentrate Here (high importance, low performance), Keep Up the Good Work (high importance, high performance), Low Priority (low importance, low performance), and Possible Overkill (low importance, high performance) [17], [18]. The position of the crosshairs can change the result [32]. So we report the grand-mean rule, and we checked the stability of each quadrant with 2,000 bootstrap samples.

The last analysis is Pearson correlation. It tests the relation between the mean satisfaction of each respondent on each dimension and the IT Business Value score of the same respondent. Previous IS success studies used the same method [21]. Each dimension score is the average of several items, so it is close to interval data and Pearson's r can be used. Spearman's rho was also calculated as a robustness check, because each item is ordinal. The coefficient for each dimension was calculated with (3).

$$\mathrm{r_j} = \frac{\sum(\mathrm{S_{i,j}} - \mathrm{S_{avg}})(\mathrm{V_i} - \mathrm{V_{avg}})}{\sqrt{\left[\sum(\mathrm{S_{i,j}} - \mathrm{S_{avg}})^2 \sum(\mathrm{V_i} - \mathrm{V_{avg}})^2\right]}} \tag{3}$$

where r_j is the correlation between satisfaction on dimension j and IT Business Value, $S_{i,j}$ is the satisfaction score of respondent i on dimension j, V_i is the IT Business Value score of respondent i, and S_{avg} and V_{avg} are their means. There are seven tests, so the p values were adjusted with the Holm method. The Bonferroni result is also mentioned. Each coefficient has a bootstrap 95% confidence interval from 5,000 samples. The strength of correlation follows Schober, Boer, and Schwarte [45]: 0.00 to 0.09 is negligible, 0.10 to 0.39 is weak, 0.40 to 0.69 is moderate, 0.70 to 0.89 is strong, and 0.90 to 1.00 is very strong. We also repeated the correlation without BV3, because BV3 is similar to some Reliability and Fulfillment items. The respondents are not a probability sample. Following Lakens on sample size with limited resources [46], we focus on effect size and confidence interval. The p value is used to see how consistent the relation is in this group. It is not used to generalize to a bigger population.

RESULT AND DISCUSSION

Respondent Profile

This study uses 23 respondents, as described in the Method Section, to carry out the analysis. They all are part-time and field workers who completed three questionnaires. There are 16 women and 7 men among them. On age, time at work, and the main outlet, there was no question. Moreover, employees move to the outlets and do not have the main outlet. All respondents use the self-scheduling system. They used the payroll module for about few days when the satisfaction questionnaire was carried out.

Validity and Reliability of the E-Service Quality Instrument

Table 3 shows the item-total correlation (r-count) for the expectation and satisfaction versions of the 21 items. The r-table for n = 23 is 0.413. Seventeen item pairs are valid. Four pairs were removed because at least one version is below the r-table. They are E1.1/E2.1 (Efficiency), F1.2/F2.2 (Fulfillment), P1.1/P2.1 (Privacy), and CP1.1/CP2.1 (Compensation).

Table 3. E-service quality item validity results (pearson item-total correlation, n = 23, r-table = 0.413)

Dimension	Item pair (E / S)	r-count (E)	r-count (S)	Status
Efficiency	E1.1 / E2.1	0.254	0.673	Invalid
Efficiency	E1.2 / E2.2	0.598	0.597	Valid
Efficiency	E1.3 / E2.3	0.442	0.757	Valid
Fulfillment	F1.1 / F2.1	0.703	0.611	Valid
Fulfillment	F1.2 / F2.2	0.334	0.596	Invalid
Fulfillment	F1.3 / F2.3	0.622	0.660	Valid
Reliability	RE1.1 / RE2.1	0.725	0.784	Valid
Reliability	RE1.2 / RE2.2	0.469	0.696	Valid
Reliability	RE1.3 / RE2.3	0.664	0.453	Valid
Privacy	P1.1 / P2.1	0.175	0.180	Invalid
Privacy	P1.2 / P2.2	0.547	0.784	Valid
Privacy	P1.3 / P2.3	0.667	0.813	Valid
Responsiveness	RS1.1 / RS2.1	0.562	0.669	Valid
Responsiveness	RS1.2 / RS2.2	0.764	0.770	Valid
Responsiveness	RS1.3 / RS2.3	0.635	0.714	Valid
Compensation	CP1.1 / CP2.1	0.351	0.402	Invalid
Compensation	CP1.2 / CP2.2	0.638	0.641	Valid
Compensation	CP1.3 / CP2.3	0.654	0.611	Valid
Contact	CT1.1 / CT2.1	0.579	0.790	Valid
Contact	CT1.2 / CT2.2	0.686	0.648	Valid
Contact	CT1.3 / CT2.3	0.652	0.882	Valid

Table 4 shows the Cronbach's alpha of the 17 valid items. The expectation and satisfaction versions are both above 0.8, so the reliability is good.

Table 4. E-service quality reliability results

Variable	Cronbach's Alpha
Expectation	0.909
Satisfaction	0.937

Gap Analysis and Service Quality Index

Table 5 shows the mean and standard deviation of expectation and satisfaction, the gap, the quality index, and the Wilcoxon signed-rank test for each dimension.

Table 5. Gap analysis, service quality index, and gap significance by dimension

Dimension	Expectation M (SD)	Satisfaction M (SD)	Gap	Quality Index	p	p (Holm)	d_z
Efficiency	4.57 (0.53)	4.37 (0.61)	−0.20	0.957	0.117	0.234	−0.27
Fulfillment	4.57 (0.46)	4.22 (0.70)	−0.35	0.924	0.009	0.034	−0.63
Reliability	4.78 (0.33)	4.10 (0.60)	−0.68	0.858	<0.001	<0.001	−1.54
Privacy	4.74 (0.33)	4.41 (0.72)	−0.33	0.931	0.017	0.050	−0.55
Responsiveness	4.65 (0.43)	4.28 (0.51)	−0.38	0.919	0.002	0.010	−0.90
Compensation	4.59 (0.47)	4.39 (0.58)	−0.20	0.957	0.137	0.234	−0.33
Contact	4.72 (0.37)	4.36 (0.61)	−0.36	0.923	0.005	0.025	−0.75

Average	4.66	4.30	−0.36	0.924

Note: Gaps and indices are computed from unrounded means. p = Wilcoxon signed-rank test; p (Holm) = Holm-adjusted across seven dimensions; d_z = mean gap divided by the standard deviation of the paired differences.

All seven dimensions show a gap and the average is −0.36. This means that satisfaction is lower than expectation in every dimension. Reliability has the gap at −0.68. The p value is than 0.001 after the Holm adjustment and the dz is −1.54. Responsiveness, Contact and Fulfillment are next. These four gaps are still significant after the Holm correction. The Privacy gap is significant before correction with a p value of 0.017. After correction the p value is 0.050, which's on the border. The gaps for Efficiency and Compensation are −0.20. These are not different from zero, with an adjusted p value of 0.234. So, these two dimensions can be considered to meet the expectation. The paired t-test gives the result. The mean scores are high, between 4.10 and 4.78. About 68.8% of expectation answers and 43.2% of satisfaction answers are at the highest score. This is a ceiling effect, and it makes the difference between dimensions small. Small differences in gap and quadrant position must be read carefully.

Validity and Reliability of the IT Business Value Instrument

Seven of the eight IT Business Value items are valid. BV7 (Commitment/Retention Impact) has an item-total correlation of 0.335. This is below the r-table of 0.413, so BV7 was removed. The same item-total method was used as for the e-service quality items. The seven valid items have a Cronbach's alpha of 0.842. Table 6 shows the result for each sub-construct. After BV7 was removed, Commitment/Retention Impact has only one item, BV8. One item cannot measure the whole sub-construct. Also, the correlations between the two items in the other sub-constructs are only 0.28 to 0.56. Because of this, we do not analyze the sub-constructs one by one. All analyses use the composite of seven items. BV8 has a strong correlation with the mean of the other six items (r = 0.86), so it is kept in the composite.

Table 6. IT business value validity results

Sub-construct	Items Tested	Items Valid	Invalid Items
Efficiency Impact	2	2	–
Trust Impact	2	2	–
Flexibility Support	2	2	–
Commitment/Retention Impact	2	1	BV7

The IT Business Value score, the mean of the seven valid items, is 4.44 (SD = 0.51) on the five-point scale. This shows that employees see quite high business value in the system.

Importance-Performance Analysis

Fig. 3(a) shows the mean expectation and satisfaction of each dimension with the grand-mean crosshairs (E_{avg} = 4.66, S_{avg} = 4.30). Fig. 3(b) shows the grid with derived importance. Table 7 shows both results and the bootstrap stability of each quadrant.

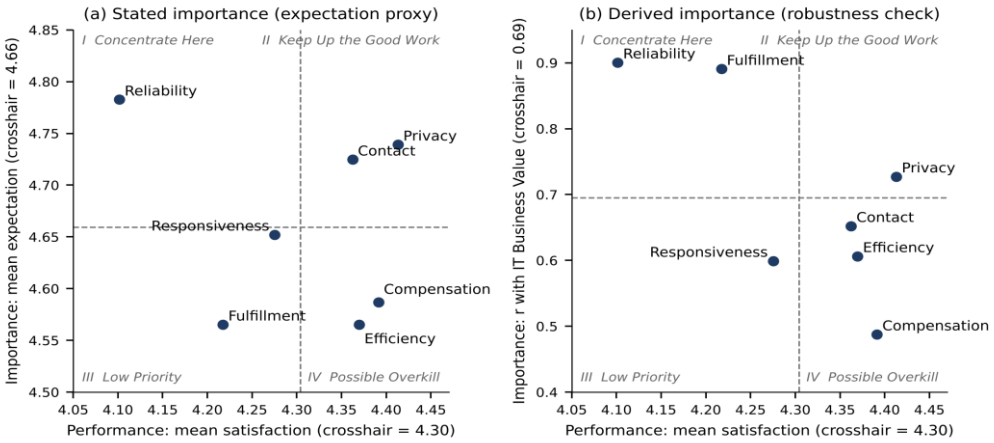


Figure 3. Importance-performance analysis quadrant maps: (a) stated importance (expectation), (b) derived importance (correlation with IT business value)

Table 7. Importance-performance analysis quadrant mapping (stated and derived importance)

Dimension	Importance (E)	Performance (S)	Quadrant (stated)	Stability (%)	Derived importance (r)	Quadrant (derived)
Reliability	4.78	4.10	I Concentrate Here	100	0.900	I Concentrate Here
Privacy	4.74	4.41	II Keep Up the Good Work	86	0.727	II Keep Up the Good Work
Contact	4.72	4.36	II Keep Up the Good Work	77	0.652	IV Possible Overkill
Responsiveness	4.65	4.28	III Low Priority	36	0.599	III Low Priority
Compensation	4.59	4.39	IV Possible Overkill	77	0.488	IV Possible Overkill
Efficiency	4.57	4.37	IV Possible Overkill	69	0.606	IV Possible Overkill
Fulfillment	4.57	4.22	III Low Priority	82	0.891	I Concentrate Here

Note: Stability = share of 2,000 bootstrap resamples in which the dimension kept its stated-importance quadrant. Derived importance = Pearson r with IT Business Value (crosshair = 0.69).

With stated importance Reliability is the dimension in Quadrant I (Concentrate Here). Reliability remains in this quadrant in every bootstrap sample. Privacy and Contact are placed in Quadrant II (Keep Up the Good Work). Fulfillment and Responsiveness are placed in Quadrant III (Low Priority). Efficiency and Compensation are placed in Quadrant IV (Possible Overkill). Responsiveness sits close to both crosshairs. Responsiveness remains in the quadrant in only thirty-six percent of the samples therefore Responsiveness position is not stable. With importance Reliability remains in Quadrant I. However, Fulfillment moves from Quadrant III to Quadrant I and Contact move from Quadrant II to Quadrant IV. All other dimensions stay in the quadrant.

Correlation Between E-Service Quality and IT Business Value

Table 8 shows the correlation between satisfaction on each dimension and the IT Business Value score, calculated with (3). The table also shows the bootstrap confidence interval, the Holm-adjusted p value, and Spearman's rho.

Table 8. Correlation between satisfaction per dimension and IT business value

Dimension	r	95% CI	p	p (Holm)	ρ	p (ρ)	Strength
Reliability	0.900	0.77 to 0.95	<0.001	<0.001	0.794	<0.001	Very strong
Fulfillment	0.891	0.70 to 0.96	<0.001	<0.001	0.801	<0.001	Strong
Privacy	0.727	0.44 to 0.90	<0.001	<0.001	0.688	<0.001	Strong
Contact	0.652	0.35 to 0.85	<0.001	0.003	0.592	0.003	Moderate
Efficiency	0.606	0.29 to 0.80	0.002	0.006	0.534	0.009	Moderate
Responsiveness	0.599	0.28 to 0.80	0.003	0.006	0.538	0.008	Moderate
Compensation	0.488	0.21 to 0.68	0.018	0.018	0.472	0.023	Moderate

Note: CI = bootstrap 95% confidence interval (5,000 resamples); p (Holm) = Holm-adjusted across seven tests; ρ = Spearman's rho.

All seven dimensions have a positive correlation with IT Business Value. All of them are still significant after the Holm correction. Reliability (r = 0.900) and Fulfillment (r = 0.891) have the strongest correlation. Privacy (r = 0.727) and Contact (r = 0.652) come next. Efficiency, Responsiveness, and Compensation are moderate (r = 0.606, 0.599, and 0.488). With the Bonferroni correction, Compensation is not significant anymore (adjusted p = 0.128). Its confidence interval is also wide (0.21 to 0.68). So, the Compensation result must be read with caution. The Spearman values are a bit lower, but the top dimensions are the same. When BV3 is removed, the results almost do not change (Reliability 0.901, Fulfillment 0.883, Compensation 0.481).

The three layers point to the dimension Reliability. Reliability has the gap (−0.68). Reliability is the dimension that remains in the Concentrate Here quadrant. Reliability also shows the correlation with IT Business Value (r = 0.900). This result is like e- research, where e-service quality is closely related to public trust [6]. Müller et al. Also found that trust in a workplace system grows from the user's experience with

the system [13]. So, Reliability may also be important, in digital administrative systems. However, one case is not enough to prove this.

Fulfillment: A Priority Revealed by the Outcome Layer

The most interesting result is Fulfillment. With stated importance, Fulfillment is in the "Low Priority" quadrant. But it has the second strongest correlation with IT Business Value ($r = 0.891$, 95% CI 0.70 to 0.96). Its gap is also significant (-0.35, Holm-adjusted $p = 0.034$). When derived importance is used, Fulfillment moves to the Concentrate Here quadrant, next to Reliability. This shows a known problem of IPA. Stated importance is often high for all dimensions, so a dimension that really affects the outcome can be classified as low priority [30], [32]. Guzmán-Leguel and Rodríguez-Lara suggested adding an outcome-based step to IPA [47]. In this study, this step shows the problem. If only IPA was used, Fulfillment would probably be put at the bottom of the list. For us, this is the clearest example of what the third layer adds. Evaluations of similar systems should not use the quadrant result as the final ranking.

Other Dimensions and the Flexible-Work Context

Efficiency and Compensation are in the Possible Overkill quadrant, and their gaps are not different from zero. Usually, IPA suggests moving resources away from this quadrant [31]. Both dimensions still show a positive correlation with IT Business Value with r values of 0.606 and 0.488. The Compensation dimension is the weakest. The current performance of these dimensions can be viewed as a standard. Removing these dimensions would not make the system special. It could cause problems. Wattanakamolchai and Choibamroong gave a warning when they used the same quadrant model [31]. Therefore, I recommend keeping the performance of these two dimensions and not cutting their resources.

The results also fit the context of this study. In a workforce that chooses its shifts and outlets the relationship between Reliability, trust and value may be stronger. A barista who moves between outlets does not meet the administrator every day unlike staff who stay in one location. Consequently, the consistency of the payroll system becomes a sign that the company can be trusted [11] [14]. However, this study did not test this explanation because there was no comparison group, with fixed-location workers.

For the company, the first recommendation is to reduce errors in the fee calculation per shift and per outlet. The second priority is Fulfillment. Pay must arrive on time and must be the same as shown in the system. For future evaluations of similar systems, we suggest adding a correlation step to IPA, and not using the quadrant result only.

Limitations

This study has limitations. First the analysis is based on 23 out of 72 workers. These workers were not chosen randomly. They form a -probability sample. This means they may not reflect all workers. So, the results only apply to this group. Second the study relies on a case and cross-sectional data. This kind of data can show relationships between variables. It cannot prove cause and effect. It also cannot be applied to situations or groups. Third all the data were reported by the people. The data are, about a system that their employer manages. Because the same people provided all responses there is a risk of method variance. Also people may answer in ways they think are socially acceptable which could inflate the correlations [48]. The three stages of data collection happened at times. The owner and the supervisor did not see the responses. This helps reduce bias.. It does not completely remove the risk. Informed consent was given orally not in writing. The study also did not go through an ethics review.

Fourth the mean scores are high. Many answers are at the maximum. The ceiling effect makes it hard to separate the dimensions. Fifth the payroll module was only used for two months before the satisfaction survey. The opinion of employees may change after use. Sixth only gender was recorded so we cannot compare the profile of the respondents with all workers. Seventh expectation was used as importance. The derived importance grid helps. It cannot replace asking respondents about importance directly. Finally, Commitment/Retention Impact has one item after BV7 was removed. Some items are also similar across constructs. RE2.2, F2.1 and BV3 all ask about pay accuracy. This may explain part of the high correlations for Reliability and Fulfillment although removing BV3 did not change them much. Future studies should use the framework with samples from several organizations use longitudinal data and test the IT Business Value instrument further for example, with structural equation modeling.

CONCLUSION

This study proposed a framework that combines e-service quality gap analysis, Importance-Performance Analysis, and correlation with IT Business Value. The framework was applied to the digital payroll system of an F&B business with flexible workers in four outlets. Satisfaction is lower than expectation in all seven dimensions. The gaps of Reliability, Responsiveness, Contact, and Fulfillment are significant. Reliability is the only dimension that stays in the Concentrate Here quadrant, and it has the strongest correlation with IT Business Value. The correlation layer also shows that Fulfillment is more important than its stated importance. IPA alone did not show this. For the company, the first step is to fix the accuracy and consistency of the fee calculation per shift and per outlet. The next step is to make sure pay arrives on time and is the same as in the system. The dimensions that already meet expectation should be kept at the current level. The data come from 23 respondents in one company, and the data are self-reported and cross-sectional. So the results are an example of how the framework works, not a proof. The next step is to use the framework with bigger samples from several organizations and with longitudinal data.

REFERENCES

[1] S. Supramono, T. W. Damayanti, M. R. Rita, and P. K. Y. Nastiti, "Explaining digital transformation in the food and beverage sector using a behavioral approach," *Journal of Infrastructure, Policy and Development*, vol. 8, no. 8, art. 5363, pp. 1-14, 2024, doi: 10.24294/jipd.v8i8.5363.

[2] S. Chatterjee, R. Chaudhuri, D. Vrontis, and A. Galati, "Digital transformation using industry 4.0 technology by food and beverage companies in post COVID-19 period: From DCV and IDT perspective," *European Journal of Innovation Management*, 2023, doi: 10.1108/EJIM-07-2022-0374.

[3] R. V. P. Hafidz and A. Setiawan, "What affects user satisfaction of payroll information systems?," in *2022 International Conference on Data Science and Its Applications (ICoDSA)*, 2022, pp. 257-261, doi: 10.1109/ICoDSA55874.2022.9862938.

[4] I. Niankara and A. R. M. Islam, "The impact of B2P electronic payroll and G2P digital welfare on formal financial inclusion in the global open economy," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 9, no. 2, art. 100034, 2023, doi: 10.1016/j.joitmc.2023.100034.

[5] O. Yaakoubi, Y. El Guenuni, N. Srainy, I. Iraqi, and O. Boubker, "Mapping research trends on quality in electronic services: A scoping review," *Administrative Sciences*, vol. 15, no. 9, art. 373, pp. 1-17, 2025, doi: 10.3390/admsci15090373.

[6] T. Taufiqurokhman, E. Satispi, Andriansyah, M. Murod, and E. Sulastri, "The impact of e-service quality on public trust and public satisfaction in e-government public services," *International Journal of Data and Network Science*, vol. 8, no. 2, pp. 765-772, 2024, doi: 10.5267/j.ijdns.2024.1.002.

[7] M. F. Rafi, H. H. Nuha, and M. Al Makky, "Analysis of user satisfaction levels in the My Tel-U application using the e-SERVQUAL and importance performance analysis (IPA) methods," in *2023 11th International Conference on Information and Communication Technology (ICoICT)*, 2023, pp. 377-382, doi: 10.1109/ICoICT58202.2023.10262499.

[8] S. Bindra, S. Bhattacharya, and S. Bhattacharya, "Traditional to digital: Human resource management transformation," *Journal of Work-Applied Management*, 2025, doi: 10.1108/JWAM-02-2025-0019.

[9] S. Bangura, "Human resource information system (HRIS): Navigating the implementation, challenges, and benefits," *International Journal of Business and Management Sciences*, vol. 5, no. 10, pp. 25-32, 2024, doi: 10.56734/ijbms.v5n10a3.

[10] P. Yadav and K. Bagri, "Flexible work culture: Prospects and trends through a bibliometric and systematic review," *IIM Ranchi Journal of Management Studies*, vol. 4, no. 2, pp. 183-205, 2025, doi: 10.1108/IRJMS-10-2024-0126.

[11] L. Baum and R. Rau, "Balancing work and private life: When does workplace flexibility really help? New insights into the interaction effect of working from home and job autonomy," *Frontiers in Organizational Psychology*, vol. 2, art. 1271726, 2024, doi: 10.3389/forgp.2024.1271726.

[12] A. Avgoustaki and A. Cañibano, "Flexible working and employee well-being: Why does the difference between formal FWAs and informal flexibility i-deals matter?," *European Management Journal*, vol. 43, no. 3, pp. 492-501, 2025, doi: 10.1016/j.emj.2024.04.006.

[13] L. S. Müller, C. Nohe, S. Reiners, J. Becker, and G. Hertel, "Adopting information systems at work: A longitudinal examination of trust dynamics, antecedents, and outcomes," *Behaviour & Information Technology*, vol. 43, no. 6, pp. 1096-1128, 2024, doi: 10.1080/0144929X.2023.2196598.

[14] M. Mohiya, "How much does employees' trust really matter in using human resources social technology system (HRSTS)?," *Journal of Posthumanism*, vol. 5, no. 5, pp. 2814-2826, 2025, doi: 10.63332/joph.v5i5.1675.

[15] A. Parasuraman, V. A. Zeithaml, and A. Malhotra, "E-S-QUAL: A multiple-item scale for assessing electronic service quality," *Journal of Service Research*, vol. 7, no. 3, pp. 213-233, 2005, doi: 10.1177/1094670504271156.
[16] H. J. Christanto, Lukas, S. A. Sutresno, and J. Karolen, "Evaluating user satisfaction of IT services through service quality approach," *Ingénierie des Systèmes d'Information*, vol. 29, no. 2, 2024, doi: 10.18280/isi.290225.
[17] J. A. Martilla and J. C. James, "Importance-performance analysis," *Journal of Marketing*, vol. 41, no. 1, pp. 77-79, 1977, doi: 10.1177/002224297704100112.
[18] S.-J. Lu et al., "Identification of quality gaps in healthcare services using the SERVQUAL instrument and importance-performance analysis in medical intensive care," *BMC Health Services Research*, vol. 20, no. 1, pp. 1-11, 2020, doi: 10.1186/s12913-020-05764-8.
[19] E. Ayhan, P. S. I. Wna, and D. Al, "Evaluation of citizen satisfaction with e-services: An analysis using the E-GovQual model and importance-performance analysis," *Journal of Intelligent Management Decision*, vol. 4, no. 1, pp. 1-22, 2025, doi: 10.56578/jimd040101.
[20] W. H. DeLone and E. R. McLean, "The DeLone and McLean model of information systems success: A ten-year update," *Journal of Management Information Systems*, vol. 19, no. 4, pp. 9-30, 2003, doi: 10.1080/07421222.2003.11045748.
[21] M. Al-Okaily and A. Al-Okaily, "An empirical assessment of enterprise information systems success in a developing country: The Jordanian experience," *The TQM Journal*, vol. 34, no. 6, pp. 1958-1975, 2022, doi: 10.1108/TQM-09-2021-0267.
[22] S. B. G. C., S. K. Gurung, S. B. J. B. Rana, and B. R. Dhungana, "e-Governance, citizen satisfaction and net benefits: The moderating effect of digital divide," *Cogent Business & Management*, vol. 11, no. 1, art. 2402512, 2024, doi: 10.1080/23311975.2024.2402512.
[23] M. Al-Kofahi, H. Hassan, and R. Mohamad, "DeLone and McLean information systems success model: A literature review," *International Journal of Business Information Systems*, vol. 48, no. 4, pp. 452-481, 2025.
[24] P. Nugraheni, E. S. Darma, and R. Muhammad, "Adoption of digital technology and financial knowledge: Strategies for achieving sustainable performance of MSMEs," *Journal of Risk and Financial Management*, vol. 18, no. 11, art. 646, 2025, doi: 10.3390/jrfm18110646.
[25] N. Palamidovska-Sterjadovska, T. Rasul, W. M. Lim, A. Ciunova-Shuleska, W. J. Ladeira, F. De Oliveira Santini, and I. Bogoevska-Gavrilova, "Service quality in mobile banking," *International Journal of Bank Marketing*, vol. 43, no. 6, pp. 1195-1230, 2025, doi: 10.1108/IJBM-02-2024-0105.
[26] L. Pham, Y. B. Limbu, M. T. T. Le, and N. L. Nguyen, "E-government service quality, perceived value, satisfaction, and loyalty: Evidence from a newly emerging country," *Journal of Public Policy*, vol. 43, no. 4, pp. 812-833, 2023, doi: 10.1017/S0143814X23000296.
[27] X. Ye, X. Su, Z. Yao, L. Dong, Q. Lin, and S. Yu, "How do citizens view digital government services? Study on digital government service quality based on citizen feedback," *Mathematics*, vol. 11, no. 14, art. 3122, 2023, doi: 10.3390/math11143122.
[28] S. Aydemir and E. Kıpçak, "The impact of internal service quality and ethical leadership on employee performance," *Sustainability*, vol. 16, no. 21, art. 9446, 2024, doi: 10.3390/su16219446.
[29] X. J. Mamakou, P. Zaharias, and M. Milesi, "Measuring customer satisfaction in electronic commerce: The impact of e-service quality and user experience," *International Journal of Quality & Reliability Management*, vol. 41, no. 3, pp. 915-943, 2024, doi: 10.1108/IJQRM-07-2021-0215.
[30] E.-A. Botezat, O. I. Ban, A. L. Popa, D. C. Coita, and T. M. Tarcza, "Optimized decisions for smart tourism destinations: A cross-generational perspective using an improved importance-performance analysis," *Systems*, vol. 12, no. 8, art. 297, 2024, doi: 10.3390/systems12080297.
[31] S. Wattanakamolchai and T. Choibamroong, "Passenger experience management strategies for Bangkok Suvarnabhumi Airport," *Tourism and Hospitality*, vol. 6, no. 4, art. 175, 2025, doi: 10.3390/tourhosp6040175.
[32] H. Oh, "Revisiting importance-performance analysis," *Tourism Management*, vol. 22, no. 6, pp. 617-627, 2001, doi: 10.1016/S0261-5177(01)00036-X.
[33] M. G. Sumampouw, L. Wikarsa, and A. M. Rumondor, "Application of importance performance analysis method for service identification in the learning process," *Journal of Information Technology and Its Utilization*, vol. 7, no. 1, pp. 9-18, 2024, doi: 10.56873/jitu.7.1.5577.
[34] S. Schweikl and R. Obermaier, "Lost in translation: IT business value research and resource complementarity, an integrative framework, shortcomings and future research directions," *Management Review Quarterly*, vol. 73, no. 4, pp. 1713-1749, 2023, doi: 10.1007/s11301-022-00284-7.

[35] N. Dhiman, S. Kumar, and T. Nagpal, “Employee's intentions to use HR analytics: Technology acceptance model with job relevance and self-efficacy,” *Vision*, 2023, doi: 10.1177/09722629231183540.
[36] A. Tenhiälä, D. J. Chung, and T.-Y. Park, “Procedural pay transparency, motivational climate, and employee outcomes,” *Compensation & Benefits Review*, 2024, doi: 10.1177/08863687231216135.
[37] L. Versteegt, M. van Dijke, J. van Ruysseveldt, and K. van den Bos, “When employees experience low levels of job autonomy, fair procedures buffer unfair outcomes,” *Frontiers in Psychology*, vol. 13, art. 784853, 2022, doi: 10.3389/fpsyg.2022.784853.
[38] C. N. Nguyen, G. Hoang, and T. T. Luu, “Frontline employees' turnover intentions in tourism and hospitality sectors: A systematic literature review and research agenda,” *Tourism Management Perspectives*, vol. 49, art. 101197, 2023, doi: 10.1016/j.tmp.2023.101197.
[39] T. Dogru, S. McGinley, A. Sharma, C. Isık, and L. Hanks, “Employee turnover dynamics in the hospitality industry vs. the overall economy,” *Tourism Management*, vol. 99, art. 104783, 2023, doi: 10.1016/j.tourman.2023.104783.
[40] M. Lin and H. Guo, “The impact of organizational trust on employee retention intention: The mediating effects of management innovation and job satisfaction,” *The EUrASEANs: Journal on Global Socio-Economic Dynamics*, vol. 8, no. 5(42), pp. 103-116, 2023.
[41] C. Gutierrez, T. Obloj, and T. Zenger, “Pay transparency and productivity,” *Strategic Management Journal*, vol. 46, no. 8, pp. 1831-1860, 2025, doi: 10.1002/smj.3707.
[42] S. Carpenter, “Ten steps in scale development and reporting: A guide for researchers,” *Communication Methods and Measures*, vol. 12, no. 1, pp. 25-44, 2018, doi: 10.1080/19312458.2017.1396583.
[43] World Medical Association, “World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human participants,” *JAMA*, vol. 333, no. 1, pp. 71-74, 2025, doi: 10.1001/jama.2024.21972.
[44] K. P. Aji, A. S. Purnomo, I. Nurkumalawati, A. R. Wiraputra, S. K. Bawono, Sohirin, and Wilonotomo, “Investigating the role of e-service quality and information quality on e-government user satisfaction in the immigration department,” *International Journal of Data and Network Science*, vol. 8, no. 4, pp. 2499-2508, 2024, doi: 10.5267/j.ijdns.2024.5.008.
[45] P. Schober, C. Boer, and L. A. Schwarte, “Correlation coefficients: Appropriate use and interpretation,” *Anesthesia & Analgesia*, vol. 126, no. 5, pp. 1763-1768, 2018, doi: 10.1213/ANE.0000000000002864.
[46] D. Lakens, “Sample size justification,” *Collabra: Psychology*, vol. 8, no. 1, art. 33267, 2022, doi: 10.1525/collabra.33267.
[47] Y. M. Guzmán-Leguel and S. Q. Rodríguez-Lara, “Assessment of patients' quality of care in healthcare systems: A comprehensive narrative literature review,” *Healthcare*, vol. 13, no. 14, art. 1714, 2025, doi: 10.3390/healthcare13141714.
[48] P. M. Podsakoff, N. P. Podsakoff, L. J. Williams, C. Huang, and J. Yang, “Common method bias: It's bad, it's complex, it's widespread, and it's not easy to fix,” *Annual Review of Organizational Psychology and Organizational Behavior*, vol. 11, pp. 17-61, 2024, doi: 10.1146/annurev-orgpsych-110721-040030.