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THE EFFECTIVENESS OF DIGITAL TRANSFORMATION ON IMPROVING FIRM PERFORMANCE: EVIDENCE FROM INDONESIA

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Abstract. *Purpose* – This study assesses the effectiveness of digital transformation on improving firm performance. A prominent financing company in Indonesia was selected in this study considering that financing industry is at the forefront of implementing digital transformation.

Research methodology – The assessment of digital transformation effectiveness is approached as a multi criteria decision-making problem. The Analytic Hierarchy Process (AHP) is employed across a 5-level decision hierarchy encompassing objective, desired value creation, expected outcomes, processes, and effectiveness of digital transformation. Senior executives at the company provided expert judgments through pairwise comparisons. To strengthen validity, a funnel triangulation approach integrates findings with resource-based view and dynamic capabilities theoretical lenses.

Findings – The study reveals that digital transformation has moderately to strongly enhanced firm performance in the examined company. With respect to value creation, the company being studied places firm value as the most prioritized value creation, followed by customer value and stakeholder value.

Research limitations – The decision model developed in this study only consider all processes that have direct impacts on firm performance. Realizing digital transformation requires interaction between people, machines, business processes and leadership from top management.

Practical implications – While this is a single-company case study, the AHP-based decision model can be adapted to assess digital transformation in other firms.

Originality/Value – The study provides a structured decision model for assessing digital transformation effectiveness.

Keywords: digital transformation, firm performance, analytic hierarchy process.

JEL Classification: G23, L84, M19.

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1. Introduction

Rapid advancements in digital technologies push organizations to implement digital transformation to maintain competitiveness (Bota-Avram, 2023; Hess et al., 2016; Wang et al., 2020). Digital transformation is viewed as a strategic imperative rather than just a technical upgrade (Agrawal et al., 2020; Besson & Rowe, 2012; Li et al., 2017; Rogers, 2016; Wang et al., 2020). Digital transformation is essential for achieving competitive advantage enhancing financial outcomes, improving customer experience and fostering innovation (Akarsu et al., 2025; Fitzgerald et al., 2013; Matarazzo et al., 2021; Wang et al., 2020; Zhai et al., 2022; Zhao et al., 2022).

In sectors such as manufacturing and creative industries, digital transformation has demonstrably improved firm performance (Guo & Xu, 2021; Seclen-Luna et al., 2022; Xiao et al., 2025). Other studies reveal that digital transformation improves significantly organizational performance in small medium enterprises (Chen et al., 2016; Xiao et al., 2025). Digital transformation enhances firm performance by reducing costs, improving operational efficiency and performing better innovation (Peng & Tao, 2022; Xue et al., 2024; Zhai et al., 2022).

Although digital transformation is believed to improve firm performance, empirical evidence shows that the relationship between the two remains inconclusive (Grijalba et al., 2025; Guo & Xu, 2021; Nadkarni & Prügl, 2021). Some studies reveal enhanced operational efficiency without corresponding financial gains (Guo & Xu, 2021), while others note that performance improvements depend more on human capital and process redesign than on information and communication technology investment alone (Liang et al., 2010; Lin et al., 2011). Other studies indicate that implementing digital transformation in SMEs does not directly affect firm performance (AlMulhim, 2021; Souza & Beuren, 2022). Another study also shows that in the banking sector digital transformation only improves customer engagement and financial inclusion (Abdulquadri et al., 2021).

It becomes evident that digital transformation is not just using digital technology (Tabrizi et al., 2019), but transforming business through the rebuilding of an organization's vision, key processes, key capabilities, structure and culture (Fitzgerald et al., 2013; Guo & Xu, 2021; Hess et al., 2016; Warner & Wager, 2019). Companies need to continuously strengthen their digital capabilities (Svahn et al., 2017; Warner & Wager, 2019). Verhoef et al. (2021) showed that in efforts to obtain the real benefit of digital transformation, companies need to measure their process improvement. Therefore, research on digital transformation should not only look at its relationship to firm performance, but also how key processes contribute to the effectiveness of digital transformation.

Consequently, this study aims to assess the effectiveness of digital transformation within a specific organizational setting – a leading automotive finance company in Indonesia. This sector is recognized for its advanced digital maturity (Nasution et al., 2020), providing a relevant context for this study. It is of interest to provide the direction on the prioritization of key processes that are carried out from digital transformation.

This paper will then be presented as follows: Section 2 discusses the theoretical background regarding digital transformation and its relationship to firm performance. Section 3 presents the research methodology, including data collection and processing. Section 4 presents the research results and discussion. Finally, Section 5 concludes with conclusions and recommendations for further research.

2. Literature review

Previous studies have extensively examined digital transformation's impact on firm performance (Qin et al., 2024). Quantitative studies, such as those using panel data from Chinese manufacturing firms, show a positive correlation with innovation capacity and operational performance (Guo & Xu, 2021; Nguyen-Thi-Huong et al., 2023; Zhai et al., 2022). Similarly, research in Small-to-Medium Enterprises (SMEs) has also shown performance improvements through cost reduction and efficiency gains (Chen et al., 2016).

Several studies demonstrate the mediating role of digital transformation in linking organizational antecedents to firm performance. Digital transformation mediates the relationship between human capital and firm performance in Vietnamese startups (Ghi et al., 2022; Wang et al., 2020). Other studies show that competitive pressure, IT readiness, and strategic alignment are antecedents that impact performance through digital transformation (Bota-Avram, 2023; Singh et al., 2021). Similarly, Yu et al. (2022) and Wang et al. (2020) demonstrated that digital transformation capabilities mediate the relationship between strategic orientation and operational performance. Other studies also demonstrate the significant influence of specific digital capabilities on supply chain effectiveness. Hallikas et al. (2021) and Tuo et al. (2024) revealed that digital procurement capabilities act as a mediator between external data analytics and supply chain performance.

Another study in the creative and manufacturing industries in Peru using the ordinary least square method shows a positive relationship between digital transformation and net sales and productivity (Seclen-Luna et al., 2022). Using panel data from 584 listed manufacturing companies in China from 2016 to 2020 and applying a fixed effects regression model, Zhao et al. (2022) revealed that digital transformation positively affects corporate innovation capacity. Guo and Xu (2021) using a multiple regression model showed that digital transformation is positively correlated with the operating performance and U-shaped correlated with financial performance in manufacturing companies in China.

Qualitative and case-based research further enriches this understanding. Studies in European oil and gas firms (Fernandez-Vidal et al., 2022) and Nordic manufacturing companies (Alieva & Powell, 2022) reveal how digital transformation reshapes management practices and employee behaviors. Multi-criteria approaches have also been used to prioritize digital investments in retail settings (Llorens et al., 2022). Using the fuzzy-set Qualitative Comparative Analysis (fsQCA), Llopis-Albert et al. (2021) argued that investment in an adequate measure to digital transformation is required for automotive firms to gain greater profits, productivity and competitiveness.

As competition is no longer between companies, but between supply chains, digital technology is integrated across all supply chain functions, such as procurement, manufacturing, distribution, and buyer/supplier relations (Lu et al., 2012). Analyzing this digital transformation, Rasool et al. (2022) performed a systematic literature review to identify key performance metrics, categorizing them using the classic balanced scorecard lenses: financial, customer, internal business, and innovation/learning perspectives (Kaplan & Norton, 1992).

While digital transformation is positively linked to firm performance, its specific influence on the internal processes that generate output remains unclear (Kretchmer & Khashabi, 2020). Research indicates that digital transformation often acts as a mediator, connecting key drivers to ultimate performance outcomes (Ghi et al., 2022; Singh et al., 2021). In manufacturing, where implementation is especially difficult, a clear understanding of the transformation journey is essential (Deng et al., 2026). This journey inevitably involves changing the key elements of the business (Davenport & Westerman, 2018).

Unlike previous industry-wide analyses, this research is to find out whether or not a digital transformation initiative at the firm level is effective. We argue that effectiveness depends on the underlying processes a company executes. Therefore, the purpose of this study is twofold: to determine the effectiveness of the transformation and to identify which associated processes are most significant for enhancing performance.

3. Methodology

The Analytic Hierarchy Process (AHP), a structured approach to solving multi-criteria decision problems (Saaty, 1980), is employed in this study. The research processes using the AHP is portrayed in Figure 1. There are four key processes in this research: 1. Defining the decision problem facing the company; 2. Structuring the decision problem based on the AHP decision hierarchy; 3. Performing pairwise comparisons based on the structure of the decisions made; 4. Obtaining the local and global priorities of each entity/object in the decision structure. In carrying out these processes, it requires data in the form of experts' judgment from a company implementing digital transformation. These experts represent top and senior management in the company who can provide views and assessments related to customer/firm/stakeholder values; firm performance; and business processes; and 5. Performing triangulation to validate the findings of this research. This involves cross-verifying the quantitative results derived from experts' subjective judgments on a 1–9 ratio scale with a theoretical framework analyzed using a funnel approach.

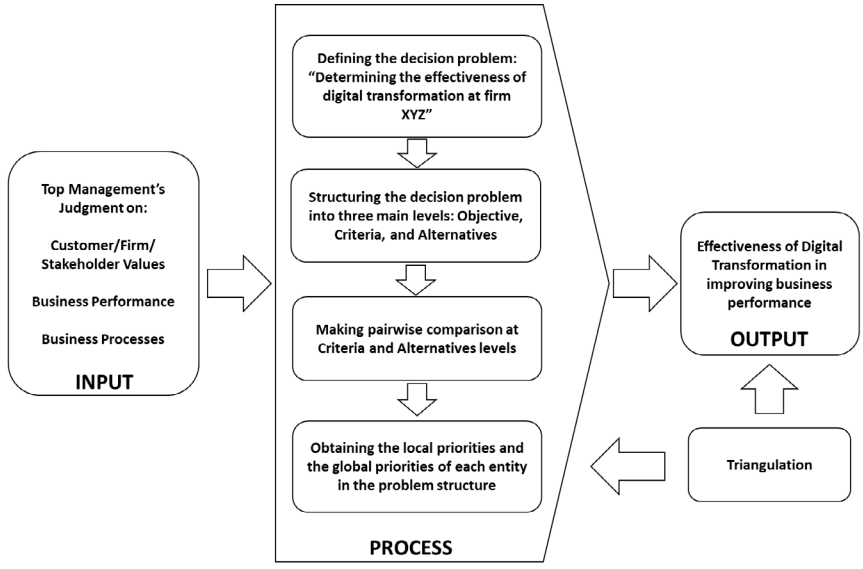

Figure 1. The AHP-based research process for the assessment of digital transformation effectiveness (source: author's processing)

3.1. Defining the decision problem

The research was conducted at a leading automotive financing companies in Indonesia, here named as PT XYZ for confidentially purpose. This company is part of a large conglomerate in Indonesia that operates a wide range of business such as automotive, financing, heavy equipment, mining, agribusiness, infrastructure, information technology and property. At the organizational level, the financing industry in Indonesia has reached the highest level, namely digital master (Nasution et al., 2020). According to Fitzgerald et al. (2013), digital

transformation aims to enable significant business improvements, for instance, by enhancing customer experience and streamlining operations.

Previous studies have primarily focus on how digital transformation affect firm performance at the industry level. On the contrary, this research is interested in the impact of digital transformation at the company level. The purpose of this study is twofold: first, to determine the effectiveness of a digital transformation initiative within a specific company in a chosen industry; and second, because this effectiveness is inherently tied to corporate processes, to identify and evaluate the importance of the relevant processes that drive firm performance.

3.2. Structuring the decision problem

Figure 2 depicts the problem structure of the AHP model employed in this research. It consists of five levels, namely objective, desired value creation, expected outcomes, processes, and effectiveness of digital transformation. At Level 1, it contains the objective of solving the problem that is to assess effectiveness of digital transformation. Like any transformation carried out by the company, digital transformation must create value as stated at Level 2. The value creation to achieve from the implementation of digital transformation includes customer value, firm value and stakeholder value.

With digital transformation, the creation of customer value occurs because it facilitates direct communication with customers (Matarazzo et al., 2021; Papa et al., 2020). Digital transformation is also intended to gain customer insight and help companies find out the desired outcomes of innovative products and services (Shahi & Sinha, 2020). Digital transformation is also carried out for the creation of firm value. Several previous studies have linked digital transformation with an increase in profitability (Llopis-Albert et al., 2021; Peng & Tao, 2022; Zhai et al., 2022; Zhao et al., 2022), in sales (Seclen-Luna et al., 2022), and risk reduction (Wu

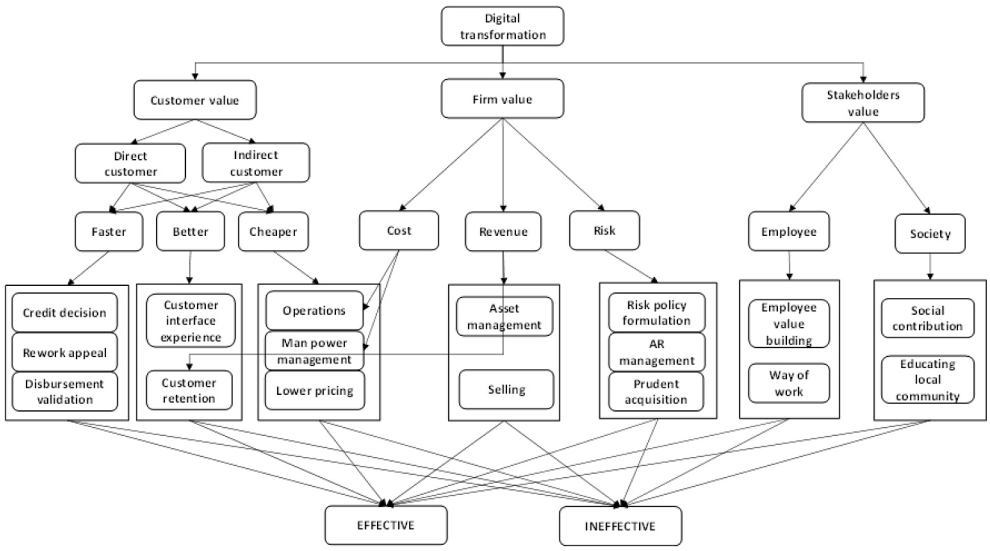

Figure 2. The AHP-based model for assessing the effectiveness of digital transformation

et al., 2022). In addition to customer and firm value, digital transformation also has an impact on stakeholder value which includes employees (Ghi et al., 2022; Rasool et al., 2022; Papa et al., 2020) and society (Junge & Straube, 2020).

Furthermore, at Level 3 there are expected outcomes of each value creation from each desired state. For customer value, both for direct and indirect customers, the expected outcomes are faster, cheaper, and better service. The expected outcomes of firm value are revenue (generation), cost (reduction), and risk (minimization). The expected outcomes of stakeholder value are expressed as the benefits received by employee and society. At Level 4 – key processes, it describes the main processes that are performed to achieve expected outcomes at Level 3. Finally, Level 5 – effectiveness, it determines whether or not digital transformation is effective in improving firm performance.

3.3. Collecting data through pairwise comparison

Considering that this is a case study involving one company, only experts who understand the business process of digital transformation are invited as interviewees. The selected interviewees are then asked to perform pairwise comparison where two objects at the lower level are compared with respect to one object at the higher level. A few senior executives from a leading Indonesian auto finance company, here named as PT XYZ, were invited to participate in this research. The interviewees consisted of a chief operating officer, a digital business division head, a retail operation division head, a national underwriting head, an underwriting development head, and an account receivable division head. This company has been undergoing a digital transformation to maintain competitiveness.

The interview process started with the structuring of the problem and proceeded to pairwise comparison process. A series of interviews had been conducted from March to December 2022. We invited a number of experts, including top and senior executives from the company, to provide their views and validate the proposed model. The AHP-based model required these interviewees to perform pairwise comparison processes.

Their expert judgments were then inputted directly into the Super decisions software. Direct input to Super decisions is required to ensure that pairwise comparisons are carried out consistently. If the pairwise comparison gives an inconsistency ratio below 10%, the results of the pairwise comparison can be accepted (Saaty, 1980). However, if the inconsistency ratio exceeds 10%, we ask the interviewees to refine the pairwise comparison until it falls below 10%.

In conducting this pairwise comparison, a 1–9 ratio scale is used to explain the relative importance of two objects at a time (Saaty, 1980). When comparing two objects, the interviewee can assign a number using this 1–9 ratio scale as follows: 1: equally important/preferred; 3: moderately important/preferred; 5: strongly important/preferred; 7: very strongly important/preferred; 9; extremely important/preferred and 2,4,6,8: intermediate values.

The following is the pairwise comparison performed starting from Level 2 to 5:

#1 Pairwise comparison at Level 2 – value creation

Here the interviewees perform pairwise comparison of customer value, firm value, and stakeholder value based on the objective of digital transformation implementation. The typical question in pairwise comparison at Level 2: "On a ratio scale of 1 to 9, which is more important in digital transformation, customer or firm value creation?"

#2 Pairwise comparison at Level 3 – expected outcomes

At level 3, the interviewees are asked to perform pairwise comparisons based on customer, firm, and stakeholder values. For pairwise comparison based on customer value, the pairwise comparison question is as follows: "On a ratio scale of 1 to 9, with respect to direct or indirect customer value, which one is more important, is it faster or cheaper service?" Based on firm value, the question is "On a ratio scale of 1 to 9, which one is more important, is it revenue making or cost reduction?" Based on stakeholder value, the question is "On a ratio scale of 1 to 9, which one is more important, is it benefit for employee or for society?"

#3: *Pairwise comparison at Level 4 – processes*

Here the interviewees perform pairwise comparisons of processes based on expected outcome at Level 3. An example of the question is "On a ratio scale of 1 to 9, which process contributes more to achieving 'Faster' service, is it credit decision or rework appeal?"

#4: *Pairwise comparison at Level 5 – results*

The last pairwise comparison process is to assess whether digital transformation is "Effective" or "Ineffective" in improving firm performance with respect to each process carried out. An example of the question is "Based on the selling process, on a ratio scale of 1 to 9, is digital transformation more Effective or more Ineffective in improving firm performance?"

3.4. Obtaining local and global priorities

Data from pairwise comparisons were processed using Super Decisions software to obtain both local and global priorities. The global priorities indicate whether or not digital transformation is effective (Level 5). To identify the drivers of this effectiveness, the local priorities at Level 4 were analyzed to determine the specific contribution of each process. Additionally, local priorities at Levels 3 and 2 illustrate the relative importance of expected outcomes and value creation goals within the organization.

It should be noted that the priorities obtained from this study are not a generalization of the Indonesian auto finance industry in implementing digital transformation. Instead, the results indicate the level of effectiveness of digital transformation within the target company and establish the specific weight of each criterion and sub-criterion.

3.5. Theoretical triangulation with a funnel approach

Having considered that the AHP is a mixed research method, where qualitative experts opinions are converted into numerical data on a ratio scale of 1 to 9 for a quantitative mathematical process, theoretical triangulation is performed to minimize bias resulted from subjective experts' judgment. A funnel triangulation approach is used to relate the macro-level grand theories with the micro-level, empirical data from this study. At the widest part of the funnel is the underlying grand theories: the resource-based view (Barney, 1991) and dynamic capabilities (Teece at al., 1997).

The RBV postulates that firms have competitive advantage through the possession of the Valuable, Rare, Inimitable and Non-substitutable (VRIN) resources. With regard to this theory, firms implementing digital transformation that invest in digital technologies, infrastructures and digitally skilled individuals have a better chance in improving firm performance. However,

in a dynamically changing environments, the VRIN resources are not sufficient. The dynamic capabilities theory posits that firms have to have the capability to reconfigure their resources to create value.

At the narrowest part of the funnel lies the empirical findings of this AHP-based research about digital transformation effectiveness. Theoretical triangulation is employed by interpreting the results obtained from the AHP model using some theoretical lenses of the RBV and dynamic capabilities to confirm the importance of the criteria and alternatives. Data triangulation is applied to minimize the individual bias in making judgments. Not only are senior executives in the company invited to perform pairwise comparison, but also multiple interviewees from various positions at different management levels to capture a comprehensive understanding of the problems facing the company being studied.

4. Results and discussion

The interview process was carried out starting from structuring the problem to conducting pairwise comparisons. A series of interviews was conducted in the period of March–December 2022. The invited interviewees consisted of a chief operating officer, a digital business division head, a retail operation division head, a national underwriting head, an underwriting development head, and an account receivable division head. After all the pairwise comparison processes were completed and all judgment interviewees were inputted into the Super Decisions software, the output of the Super Decisions is shown in Table 1.

4.1. AHP results

The digital transformation being implemented in the company has improved firm performance with the assessment scores for "Effective" of 78.15% and "Ineffective" of 21.85%. Because the score in the AHP uses a ratio scale, firm performance after digital transformation is 3.58 better than before. It can be inferred as well that digital transformation implementation has moderately to strongly improved firm performance.

$$Effectiveness\,of\,Digital\,Transformation = \begin{bmatrix} Effective \\ Ineffective \end{bmatrix} = \begin{bmatrix} 0.78148 \\ 0.21852 \end{bmatrix}. \quad (1)$$

The level of effectiveness above is the result of the criteria/factors used by the interviewees in performing pairwise comparisons. With regard to the objective of implementing digital transformation, the degree of importance of customer, firm and stakeholder values is as follows:

$$Importance\,of\,value\,creation = \begin{bmatrix} Customer\,value \\ Firm\,value \\ Stakeholder\,value \end{bmatrix} = \begin{bmatrix} 0.18839 \\ 0.73064 \\ 0.08096 \end{bmatrix}. \quad (2)$$

It is shown that "Firm value" is the most important priority in implementing digital transformation. It is shown that Firm value importance is 3.88 times more important or "moderately to strongly more important" than "Customer value" and 9.03 times more important or "extremely more important" than "Stakeholder value".

Table 1. Priorities resulted from pairwise comparison

#	Objects or entities	Normalization score	Limiting score
1	Effective	0.78148	0.18658
2	Ineffective	0.21852	0.05217
3	Customer value	0.18839	0.04498
4	Firm value	0.73064	0.17445
5	Stakeholder value	0.08096	0.01933
6	Direct customer	0.16667	0.00749
7	Indirect customer	0.83333	0.03748
8	Better	0.06055	0.01446
9	Cheaper	0.01973	0.00471
10	Faster	0.10811	0.02581
11	Revenue making	0.46541	0.11112
12	Risk reduction	0.18872	0.04506
13	Cost reduction	0.07652	0.01827
14	Employee	0.03072	0.01450
15	Society	0.02024	0.00483
16	AR management	0.01977	0.00483
17	Asset management	0.04874	0.01164
18	Credit decision	0.06965	0.01663
19	Customer interface experience	0.05046	0.01205
20	Customer retention	0.13030	0.03111
21	Disbursement validation	0.00921	0.00220
22	Educating local community	0.00506	0.00121
23	Employee value building	0.01518	0.00362
24	Lower pricing	0.00206	0.00049
25	Man power management	0.06996	0.01670
26	Operations	0.02423	0.00578
27	Prudent acquisition	0.04874	0.01164
28	Rework appeal	0.02925	0.00698
29	Risk policy formulation	0.12021	0.02870
30	Selling	0.29646	0.07078
31	Social contribution	0.01518	0.00362
32	Way of work	0.04554	0.01087

In terms of creating value for customers, the company prioritizes indirect customers over direct customers with the following preferences:

$$Importance\,of\,Expected\,outcomes = \begin{bmatrix} Better \\ Cheaper \\ Faster \\ Revenue \\ Risk \\ Cost \\ Employee \\ Society \end{bmatrix} = \begin{bmatrix} 0.06055 \\ 0.01973 \\ 0.10811 \\ 0.46541 \\ 0.18872 \\ 0.07652 \\ 0.06072 \\ 0.02024 \end{bmatrix}. \quad (3)$$

In line with the creation of firm value, which is the company's priority, the expected outcome related to firm value such as revenue generation are the most important aspects of digital implementation; followed by risk minimization and faster service speed. These are the 3 main priorities of the expected outcomes expected from digital implementation in the company.

Furthermore, expected outcomes will affect the level of importance of the processes carried out by the company. These processes also determine the effectiveness of digital transformation. The degree of importance of all processes is as follows:

$$\textit{Importance of Processes} = \begin{bmatrix} \textit{AR management} \\ \textit{Asset management} \\ \textit{Credit decision} \\ \textit{Customer interface experience} \\ \textit{Customer retention} \\ \textit{Disbursement validation} \\ \textit{Educating local community} \\ \textit{Employee value building} \\ \textit{Lower pricing} \\ \textit{Manpower management} \\ \textit{Operations} \\ \textit{Prudent acquisition} \\ \textit{Rework appeal} \\ \textit{Risk policy formulation} \\ \textit{Selling} \\ \textit{Social contribution} \\ \textit{Way of work} \end{bmatrix} = \begin{bmatrix} 0.01977 \\ 0.04874 \\ 0.06965 \\ 0.05046 \\ 0.13030 \\ 0.00921 \\ 0.00506 \\ 0.01518 \\ 0.00206 \\ 0.06996 \\ 0.02423 \\ 0.04874 \\ 0.02925 \\ 0.12021 \\ 0.29646 \\ 0.01518 \\ 0.04554 \end{bmatrix}. \quad (4)$$

Of all the processes, selling has the highest level of importance with a score of 0.29646, or more than 2 times more important or "equally to moderately more important" than Customer retention with a score of 0.13030 and risk policy formulation with a score of 0.12021. The next important process is manpower management with a score of 0.06996 which is close to the credit decision process with a score of 0.06965. Hence, selling has an importance level of 4.3 more important or "moderately to strongly more important" than manpower management and credit decisions.

These findings support previous studies showing that digital transformation positively affects firm performance (Llopis-Albert et al., 2021; Fitzgerald, 2013; Guo & Xu, 2021; Matarazzo et al., 2021; Seclen-Luna et al., 2022; Teng et al., 2022; Wang et al., 2020; Yu et al., 2022; Zhai et al., 2022). Of the seventeen processes involved in digital transformation, 15 processes have moderately to strongly improved performance as compared to performance before digital transformation. Of all these processes, selling is the process with the highest importance, twice as important as customer retention and risk policy formulation, which are the second and third most important processes in realizing expected outcomes. Selling exceeds 4 times more important than manpower management and credit decisions, which are the fourth and fifth most important processes. When compared with the rest of the processes, selling becomes so superior.

In terms of increasing revenue, which is the most expected outcome, the processes such as selling, customer retention, and asset management have 'moderately to strongly improved' revenue generation. This finding is in line with previous studies showing that digital transformation has a positive relationship with sales (Seclen-Luna et al., 2022). However, it should be noted that the increasing demand for vehicle financing during the transition from pandemic to endemic could be a contributing factor to the increase in revenue.

About reducing risk, which is 0.41 of increasing revenue, the AR management process, prudent acquisition and risk policy formulation have "moderately to strongly improved" risk reduction. This finding supports previous studies showing that digital transformation positively affects financial performance such as ROA, ROE and financial risk reduction (Peng & Tao, 2022; Wu et al., 2022; Zhai et al., 2022).

Meanwhile, regarding making service Faster, which is 0.23 of revenue generation, the credit decision processes, rework appeal, and disbursement validation have "moderately to strongly improved" the service speed. With faster service, companies can become more productive to serve more customers. Previous studies have shown that digital transformation positively affects company productivity (Gaglio et al., 2022).

In addition to increasing revenue, reducing risk and increasing service speed, which are the three most important expected outcomes, the company also places cost reduction and better service to be the next two most important expected outcomes. Reducing cost is 0.16 of increasing Revenue and making service better is 0.13 of revenue generation. In terms of cost reduction, the manpower management process has "moderately to strongly improved" its performance. This reduction in costs indicates an improvement in the efficiency of digital transformation. Previous studies from Zuo et al. (2021) and Fukuzawa et al. (2022) showed an increase in the efficiency from digital investment. Meanwhile, in terms of better service, the process of customer interface experience and customer retention have "moderately to strongly improved" its performance. This improvement in service quality supports the study of Matarazzo et al. (2021) explaining that digital instruments can provide new value delivery to customers.

Meanwhile, the importance of the expected outcome of revenue generation has far exceeded the expected outcomes of benefits for employees, society and cheaper service. Revenue generations is 15.15 more important than employee benefit; 22.99 more important than society benefit and 23.59 more important than cheaper service. These ratio scales exceed 9.0 which is the upper limit of the ratio scale used in AHP (Saaty, 1980). From this study, it is shown that digital transformation in the auto finance company being studied is not aimed at making their services cheaper. This can be explained by the presence of new digital-based financial service companies who offer a value proposition in the form of convenience and speed for borrowers to get funds (Au et al., 2020).

4.2. Theoretical interpretation

The findings demonstrate the integration of resource allocation and dynamic capability in creating value to the firm, customer and society. The Resource-Based View (RBV) perspective suggests that digital transformation pursues Valuable, Rare, Inimitable and Non-substitutable (VRIN) resources to achieve competitive advantage (Wernerfelt, 1984; Barney, 1991). This is

indicated by the extreme prioritization of firm value (0.73064) over customer (0.18839) and stakeholder (0.08096). This perspective also implies that digital transformation helps companies build their digital capabilities (Warner & Wager, 2019).

The emergence of dynamic capabilities (Teece et al., 1997) is reflected from the identification and prioritization of key processes such as selling (0.29646), customer retention (0.13030), and risk policy formulation (0.12021). The high importance on those key processes suggests that the digital transformation effectiveness is due to the firm's ability to reconfigure the most valuable digital resources and processes (selling, customer retention and risk policy formulation) to deliver the most expected outcomes that are revenue (0.46541) and risk reduction (0.18872).

Data triangulation has been conducted to minimize bias during pairwise comparison process. Although the AHP-based research relies on the expert judgment of top executives in the company, several interviewees from different units at the lower management levels were also involved in performing pairwise comparison to minimize individual bias (Saaty, 1980; Tavares et al., 2008). With the use of the Super Decisions software, the high consistency of judgments indicated by an inconsistency ratio lower than 0.10 was maintained to ensure the validity and reliability of the results.

The findings also support previous empirical studies revealing that digital transformation positively affects revenue growth, cost efficiency, and innovation performance (Seclen-Luna et al., 2022; Zhai et al., 2022). The findings are also in line with the Organizational Change Theory (OCT) in a way that digital transformation is not simply the adoption of digital technology but a comprehensive organizational change involving structures, processes and culture (Fitzgerald et al., 2013; Hess et al., 2016). This is indicated by the next importance on manpower management with a weight of 0.06996 and way of work of 0.04554. The OCT also suggests that digital transformation requires leadership, change management and employee engagement to be successful (Kotter, 1995; Verhoef et al., 2021).

5. Conclusions

An AHP-based model for assessing the effectiveness of digital transformation and how it is implemented has been presented. The application of this model in one of the largest auto finance companies in Indonesia has been performed. The result shows that digital transformation has "moderately to strongly improved" firm performance. Performing a funnel triangulation framework using theoretical lenses of the resource-based view and dynamic capabilities, it strengthens the empirical results with a sound theoretical explanation. The highest importance on firm value and key processes like selling, customer retention and risk policy formulation explains how digital resources are dynamically reconfigured to deliver expected outcomes.

In making use of the AHP-based model, the interviewees consisting of senior executives in the company were invited in determining the criteria and sub-criteria used in the decision hierarchy, especially at the level of expected outcomes and the processes. These experts were also involved in the process of pairwise comparison of entities at each level. Like any decision models using AHP, this model gives the interviewees the flexibility to provide qualitative

judgment in the form of linguistic terms which are expressed on a ratio scale of 1–9 in the pairwise comparison process. The consistency of the experts in pairwise comparisons must be maintained by entering their judgments in pairwise comparisons into the Super Decisions software during the interview process. The researcher conducting the interview must be able to facilitate the group of experts to provide unanimous opinions in the pairwise comparison process.

This case study is indeed limited to digital transformation in one company. However, the 5-level decision hierarchy starting from objectives, desired state, expected outcomes, processes and effectiveness of digital transformation can be applied to other companies implementing digital transformation. If it is used for cases in different companies, the entities or objects used at the expected outcomes and processes level need to be adjusted according to the context of the company being assessed.

The decision model developed in this study only considers all processes that have direct impacts on firm performance. Realizing digital transformation requires interaction between people, machines, business processes and leadership from top management (Davenport & Westerman, 2018), the next research should interact these perspectives to see their effectiveness in creating corporate value from digital transformation.

References

Abdulquadri, A., Mogaji, E., Kieu, T. A., & Nguyen, N. P. (2021). Digital transformation in financial services provision: A Nigerian perspective to the adoption of chatbot. *Journal of Enterprising Communities*: *People and Places in the Global Economy*, *15*(2), 258–281. https://doi.org/10.1108/JEC-06-2020-0126

Agrawal, P., Narain, R., & Ullah, I. (2020). Analysis of barriers in implementation of digital transformation of supply chain using interpretive structural modelling approach. *Journal of Modelling in Management*, *15*(1), 297–317. https://doi.org/10.1108/JM2-03-2019-0066

Akarsu, O., Bağış, M., & Kurutkan, M. N (2025). Digital leadership as micro-foundations of digital transformation, technology adaptive capability and financial performance. *Journal of Organizational Change Management*. https://doi.org/10.1108/JOCM-12-2024-0792

Alieva, J., & Powell, D. J. (2022). The significance of employee behaviours and soft management practices to avoid digital waste during a digital transformation. *International Journal of Lean Six Sigma*, *14*(1), 1–32. https://doi.org/10.1108/IJLSS-07-2021-0127

AlMulhim, A. F. (2021). Smart supply chain and firm performance: The role of digital technologies. *Business Process Management Journal*, *27*(5), 1353–1372. https://doi.org/10.1108/BPMJ-12-2020-0573

Au, C. H., Tan, B., & Sun, Y. (2020). Developing a P2P lending platform: Stages, strategies and platform configurations. *Internet Research*, *30*(4), 1229–1249. https://doi.org/10.1108/INTR-03-2019-0099

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Besson, P., & Rowe, F. (2012). Strategizing information systems-enabled organizational transformation: A transdisciplinary review and new directions. *The Journal of Strategic Information Systems*, *21*(2), 103–124. https://doi.org/10.1016/j.jsis.2012.05.001

Bota-Avram, C. (2023). *Science mapping of digital transformation in business*: *A bibliometric analysis and research outlook*. Springer. https://doi.org/10.1007/978-3-031-26765-9

Chen, Y. K., Jaw, Y., & Wu, B. (2016). Effect of digital transformation on organizational performance of SMEs: Evidence from the Taiwanese textile industry's web portal. *Internet Research*, *26*(1), 186–212. https://doi.org/10.1108/IntR-12-2013-0265

Davenport, T. H. & Westerman, G. (2018). Why so many high-profile digital transformation fail. *Harvard Business Review*, 2–6.

Deng, H., Yang, F., & Huang, W. (2026). Steered by digitization and incentives: The configuration and effect of improving innovation efficiency in manufacturing companies. *Journal of Innovation & Knowledge*, *12*, Article 100900. https://doi.org/10.1016/j.jik.2025.100900

Fernandez-Vidal, J., Gonzalez, R., Gasco, J., & Llopis, J. (2022). Digitalization and corporate transformation: The case of European oil and gas firms. *Technological Forecasting & Social Change*, *174*, Article 121293. https://doi.org/10.1016/j.techfore.2021.121293

Fitzgerald, M. (2013). How Starbucks has gone digital. *MIT Sloan Management Review*. https://sloanreview.mit.edu/article/how-starbucks-has-gone-digital/

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2013). Embracing digital technology: A new strategic imperative. *MIT Sloan Management Review*. https://sloanreview.mit.edu/projects/embracing-digital-technology/

Fukuzawa, M., Sugie, R., Park, Y., & Shi, J. (2022). An exploratory case study on metrics and performance of IoT investment in Japanese manufacturing firms. *Sustainability*, *14*(5), Article 2708. https://doi.org/10.3390/su14052708

Gaglio, C., Kraemer-Mbula, E., & Lorenz, E. (2022). The effects of digital transformation on innovation and productivity: Firm-level evidence of South African manufacturing micro and small enterprises. *Technological Forecasting & Social Change*, *182*, Article 121785. https://doi.org/10.1016/j.techfore.2022.121785

Ghi, T. N., Thu, N. Q., Huan, N. Q., & Trung, N. T. (2022). Human capital, digital transformation, and firm performance of startups in Vietnam. *Management*, *26*(1), 1–18. https://doi.org/10.2478/manment-2019-0081

Grijalba, M. A., Hernández, Y. B., Perez-Encinas, A., & Santos Urda, B. (2025). Does the use of digital tools improve a firm's performance?. *Review of Managerial Science*, *19*, 2193–2210. https://doi.org/10.1007/s11846-024-00750-4

Guo, L., & Xu, L. (2021). The effect of digital transformation on firm performance: Evidence from China's manufacturing sector. *Sustainability*, *13*(22), Article 12844. https://doi.org/10.3390/su132212844

Hallikas, J., Immonen, M., & Brax, S. (2021). Digitalizing procurement: The impact of data analytics on supply chain performance. *Supply Chain Management*, *26*(5), 629–646. https://doi.org/10.1108/SCM-05-2020-0201

Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, *15*(2), 123–139.

Junge, A. L., & Straube, F. (2020). Sustainable supply chains – digital transformation technologies' impact on the social and environmental dimension. *Procedia Manufacturing*, *43*, 736–742. https://doi.org/10.1016/j.promfg.2020.02.110

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard – measures that drive performance. *Harvard Business Review*, *70*(1), 71–79.

Kotter, J. P. (1995). Leading change: Why transformation efforts fail. *Harvard Business Review*, *73*(2), 59–67.

Kretchmer, T., & Khashabi, P. (2020). Digital transformation and organization design: An integrated approach. *California Management Review*, *62*(4), 86–104. https://doi.org/10.1177/0008125620940296

Li, L., Su, F., Zhang, W., & Mao, J.-Y. (2017). Digital transformation by SME entrepreneurs: A capability perspective. *Information Systems Journal*, *28*(6), 1129–1157. https://doi.org/ 10.1111/isj.12153

Liang, T.-P., You, J.-J., & Liu, C.-C. (2010). A resource-based perspective on information technology and firm performance: A meta analysis. *Industrial Management & Data Systems*, *110*(8), 1138–1158. https://doi.org/10.1108/02635571011077807

Lin, C., Huang, Y.-A., & Stockdale, R. (2011). Developing a B2B web site effectiveness model for SMEs. *Internet Research*, *21*(3), 304–325. https://doi.org/10.1108/10662241111139327

Llopis-Albert, C., Rubio, F., & Valero, F. (2021). Impact of digital transformation on the automotive industry. *Technological Forecasting & Social Change*, *162*, Article 120343. https://doi.org/10.1016/j.techfore.2020.120343

Llorens, M., Carrasco, R., Bueno, I., Herrera-Viedma, E., & Morente-Molinera, J. A. (2022). Multiple criteria approach applied to digital transformation in Fashion stores: The case of physical retailers in Spain. *Technological and Economic Development of Economy*, *28*(2), 500–530. https://doi.org/10.3846/tede.2022.16553

Lu, Z., Zhao, J., & Chi, M. (2012). Antecedents and consequences of e-supply chain coordination capability for enterprises: An empirical study in China. *International Journal of Networking and Virtual Organisations*, *10*(3–4), 361–373. https://doi.org/10.1504/IJNVO.2012.046457

Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, *123*, 642–656. https://doi.org/10.1016/j.jbusres.2020.10.033

Nadkarni, S., & Prügl, R. (2021). Digital transformation: A review, synthesis and opportunities for future research. *Management Review Quarterly*, *71*, 233–341. https://doi.org/10.1007/s11301-020-00185-7

Nasution, R. A., Arnita, D., Rusnandi, L. S. L., Qadariah, E., Rudito, P., & Sinaga, M. F. N. (2020). Digital mastery in Indonesia: The organization and individual contrast. *Journal of Management Development*, *39*(4), 359–390. https://doi.org/10.1108/JMD-03-2019-0081

Nguyen-Thi-Huong, L., Nguyen-Viet, H., Nguyen-Phuong, A., & Van Nguyen, D. (2023). How does digital transformation impact bank performance? *Cogent Economics & Finance*, *11*(1), Article 2217582. https://doi.org/10.1080/23322039.2023.2217582

Papa, A., Dezi, L., Gregori, G. L., Mueller, J., & Miglietta, N. (2020). Improving innovation performance through knowledge acquisition: The moderating role of employee retention and human resource management practices. *Journal of Knowledge Management*, *24*(3), 589–605. https://doi.org/10.1108/JKM-09-2017-0391

Peng, Y., & Tao, C. (2022). Can digital transformation promote enterprise performance? – From the perspective of public policy and innovation. *Journal of Innovation & Knowledge*, 7(3), Article 100198. https://doi.org/10.1016/j.jik.2022.100198

Qin, S., Liu., Z., Wang, J., & Wu, Y. (2024). The impact of digital transformation on labour demand quantity and structure: Evidence from China. *Economic Analysis and Policy*, *84*, 1452–1469. https://doi.org/10.1016/j.eap.2024.10.036

Rasool, F., Greco, M., & Grimaldi, M. (2022). Digital supply chain performance metrics: A literature review. *Measuring Business Excellence*, *26*(1), 23–38. https://doi.org/10.1108/MBE-11-2020-0147

Rogers, D. (2016). *The digital transformation playbook*: *Rethink your business for the digital age*. Columbia University Press.

Saaty, T. L. (1980). *The analytic hierarchy process*: *Planning*, *priority setting*, *resource allocation*. McGraw-Hill. https://doi.org/10.21236/ADA214804

Seclen-Luna, J. P., Vergara, R. I. C., & Valladares, H. L. (2022). Effects of the use of digital technologies on the performance of firm in a developing country: Are there differences between creative and manufacturing industries? *International Journal of Information Systems and Project Management*, *10*(1), 73–91. https://doi.org/10.12821/ijispm100104

Shahi, C., & Sinha, M. (2020). Digital transformation: Challenges faced by organizations and their potential solutions. *International Journal of Innovation Science*, *13*(1), 17–33. https://doi.org/10.1108/IJIS-09-2020-0157

Singh, S., Sharma, M., & Dhir, S. (2021). Modeling the effect of digital transformation in Indian manufacturing industry. *Technology in Society*, *67*, Article 101763. https://doi.org/10.1016/j.techsoc.2021.101763

Souza, N. A., & Beuren, I. M. (2022). Digital transformation and startup performance: intervention of management information and entrepreneurial creativity. *Revista Contabilidade*, *Gestão e Governança*, *25*(3), 435–454. http://doi.org/10.51341/cgg.v25i3.2947

Svahn, F., Mathiassen, L., & Lindgren, R. (2017). Embracing digital innovation in incumbent firms: How Volvo Cars managed competing concerns. *MIS Quarterly*, *41*(1), 239–253. https://doi.org/10.25300/MISQ/2017/41.1.12

Tabrizi, B., Lam, E., Girard, K., & Irvin, V. (2019). Digital transformation is not about technology. *Harvard Business Review*. https://hbr.org/2019/03/digital-transformation-is-not-about-technology

Tavares, R. M., Tavares, J. M. L., & Parry-Jones, S. L. (2008). The use of a mathematical multicriteria decision-making model for selecting the fire origin room. *Building and Environment*, *43*(12), 2090–2100. https://doi.org/10.1016/j.buildenv.2007.12.010

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AIDSMJ882%3E3.0.CO;2-Z

Teng, X., Wu, Z., & Yang, F. (2022). Research on the relationship between digital transformation and performance of SMEs. *Sustainability*, *14*(10), Article 6012. https://doi.org/10.3390/su14106012

Tuo, G., Appiah, M. K., Sarpong, K. O., & Okyere, S. (2024). Does supply chain resilience mediate the relation between artificial intelligence capabilities and supply chain performance? *Open Journal of Business and Management*, *12*, 4340–4358. https://doi.org/10.4236/ojbm.2024.126218

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, *122*, 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

Wang, H., Feng, J., Zhang, H., & Li, X. (2020). The effect of digital transformation strategy on performance: The moderating role of cognitive conflict. *International Journal of Conflict Management*, *31*(3), 441–462. https://doi.org/10.1108/IJCMA-09-2019-0166

Warner, K. S. R., & Wager, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning*, *52*(3), 326–349. https://doi.org/10.1016/j.lrp.2018.12.001

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, *5*(2), 171–180. https://doi.org/10.1002/smj.4250050207

Wu, K., Fu, Y., & Kong, D. (2022). Does the digital transformation of enterprises affect stock price crash risk? *Finance Research Letters*, *48*, Article 102888. https://doi.org/10.1016/j.frl.2022.102888

Xiao, Z., Li, Y., & Xiang, C. (2025). Do suppliers value customer firms' digital transformation? Evidence from trade credit provision. *International Review of Financial Analysis*, *99*, Article 103976. https://doi.org/10.1016/j.irfa.2025.103976

Xue, Z., Hou, Y., Cao, G., & Sun, G. (2024). How does digital transformation drive innovation in Chinese agribusiness: Mechanism and micro evidence. *Journal of Innovation & Knowledge*, *9*(2), Article 100489. https://doi.org/10.1016/j.jik.2024.100489

Yu, J., Wang, J., & Moon, T. (2022). Influence of digital transformation capability on operational performance. *Sustainability*, *14*(13), Article 7909. https://doi.org/10.3390/su14137909

Zhai, H., Yang, M., & Chan, K. C. (2022). Does digital transformation enhance a firm's performance? Evidence from China. *Technology in Society*, *68*, Article 101841. https://doi.org/10.1016/j.techsoc.2021.101841

Zhao, X., Sun, X., Zhao, L., & Xing, Y. (2022). Can the digital transformation of manufacturing enterprises promote enterprise innovation? *Business Process Management Journal*, *28*(4), 960–982. https://doi.org/10.1108/BPMJ-01-2022-0018

Zuo, L., Strauss, J., & Zuo, L. (2021). The digitalization transformation of commercial banks and its impact on sustainable efficiency improvements through investment in science and technology. *Sustainability*, *13*(19), Article 11028. https://doi.org/10.3390/su131911028