EVALUATION OF MAGA SWALAYAN USING INDUSTRY 4.0 CONCEPTS-BASED BALANCED SCORECARD

Thesis

Submitted to International Program
Department of Industrial Engineering
The Requirements for the Degree of
Sarjana Teknik Industri
at
Universitas Islam Indonesia

By
Agung Asaba (14522282)

INTERNATIONAL PROGRAM
INDUSTRIAL ENGINEERING DEPARTMENT
UNIVERSITAS ISLAM INDONESIA
YOGYAKARTA
2021

AUTHENTICITY STATEMENT

For the sake of Allah, I confess that this research was conducted by me except for the summaries of the sources that have been cited and mentioned. If in the future my confession is proved to be wrong and dishonest resulting in the violence of legal regulation of the papers and intellectual property rights, then I am willing to return the degree I received to be withdrawn by Universitas Islam Indonesia.

Yogyakarta, December 2021

Agung Asaba

THESIS APPROVAL OF SUPERVISOR

EVALUATION OF MAGA SWALAYAN USING INDUSTRY 4.0 CONCEPTS-BASED BALANCED SCORECARD

THESIS

By

Name : Agung Asaba

Student Number : 14522282

Yogyakarta, December 2021

Supervisor

(Muhammad Ridwan Andi Purnomo, ST., M.Sc., Ph. D)

THESIS APPROVAL OF EXAMINATION COMMITTEE

EVALUATION OF MAGA SWALAYAN USING INDUSTRY 4.0 CONCEPTS-BASED BALANCED SCORECARD

By:

Name : AGUNG ASABA
NIM : 14522282

Was defended before Examination Committee in Partial Fulfillment of the requirement for the bachelor's degree of Industrial Engineering Department

Universitas Islam Indonesia

Examination Committee

Muhammad Ridwan Andi Purnomo, ST., M.Sc., Ph.D	
Examination Committee Chair	
Dr. Taufiq Immawan, S.T., M.M.	
Member I	
Agus Mansur, S.T., M.Eng.Sc.	
Member II	

Acknowledge by,

Head of Department – Industrial Engineering

Faculty of Industrial Technology

Universitas Islam Indonesia

(Dr. Taufiq Immawan, S.T., M.M.)

PREFACE

Assalamualaikum Warahmatullahi Wabarakatuh

Alhamdulillahirabbil'alamin, gratitude, and praise to Allah Subhanahu Wata'ala for the strength, grace, and guidance, to help the Author in completing this undergraduate thesis. Sholawat and gratitude from Rasulullah Shallallahu'alaihi Wasallam with his family and friends that we await syafaat at the end of the day.

The guidance, support, and many help, either directly or indirectly, from some parties involved. On this occasion, the author would like to appreciate and thank all of the parties below:

1. My beloved family members who always give prayers, support, and encourage the Author during the completion of this Undergraduate Thesis.
2. Muhammad Ridwan Andi Purnomo, ST., M.Sc., Ph.D. as the supervisor who always guidance and provide knowledge to assist Author in completing this Undergraduate Thesis.
3. Mr. Annam, Mr. Idra, and all staff of Maga Swalayan who have assisted in the completion of this thesis.
4. Dean of the Faculty of Industrial Technology, Universitas Islam Indonesia.
5. Head of Undergraduate Program, Department of Industrial Engineering, Universitas Islam Indonesia.
6. All lecturers of the Department of Industrial Engineering, Universitas Islam Indonesia who have given knowledge.

7. My beloved future wife Shintya Dewi Saraswati to support me during up and down situation.
8. My friends of International Program Industrial Engineering batch 2014, my senior and my junior for the support, spirit, and enthusiasm for the Author.
9. All parties who cannot be mentioned one by one by Author for the assistance in completing this Undergraduate Thesis.
10. Thank you to the closest friend Aan Hasibuan and Muhammad Ardwika that always supported the author in every single situation while doing this thesis.

Authors realize that an undergraduate thesis is not the only way to achieve success in the future so that Author will learn and look for more possibilities to improve and become a better man in the future. Hopefully, this report and information will be useful for the Author and give benefit to other parties who read this.

Wasssalamu'alaikum Warahmatullahi Wabarakatuh

Balikpapan, December 2021

(Agung Asaba)
14522282

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1 Background

In the current era of industry 4.0, business competition is very competitive to obtain optimal performance and satisfactory service for the wider community. To achieve this, industries from various sectors are competing to improve performance in terms of technology, information, human resource management, and services, so that the company's existence can last for a long period of time and be able to adapt to this era. Therefore, companies need a strategy that excels in analyzing all aspects that support them to compete globally and contribute to progress and success in achieving the right targets.

There are 4 pillars that support industrial development in the current 4.0 era, including decentralization, internet of things, interoperability, and transparency. Decentralization can be interpreted as machines do not depend on human interference to work. Physical systems have sensors connected to a network, capable of making automated decisions based on performance data. In retail, the internet of things is the technology that will drive truly connected, omnichannel experiences. It is the technology that connects a customer’s mobile to a store window, a sales assistant’s tablet to an e-commerce site. IoT allows the company to maintain sales opportunities in real-time and track missed in-store sales.

Interoperability itself means the capability of two or more information systems, or components must allow the exchange and use of information across systems.

Companies in this era should understand this to maintain information flow in real-time and accurately. In

business, most customers prefer to receive precise and accurate information, as stakeholders also certainly have the same goal in order to facilitate cooperation with the companies, they establish to reach an agreement on orders, quantity, and price.

To achieve this as a company should bring transparency in the business to track every part of the business process, from order entry to inventory to finished products. This transparency will inform customers, partners, and stakeholders, making business seem less complex and easier to work with.

As one of the efforts to achieve the right target, the company needs a performance measurement model that can be used as a means of managing the company. Traditional measurement models can cause competition to become uncompetitive and uncomprehensive, therefore companies must take the right decisions and perfect structured business strategies in order to win the competition.

Performance appraisal or measurement is one of the important factors in a company. used to assess the company's success, measurement performance can also be used as a basis for the work results of the period ago. In this regard, performance measurement should be carried out regularly comprehensive, so that decision-making related to strategy can be done thoroughly. Thus, the strategy will be able to accommodate every perspective involved in determining a successful company.

Usually, an increase in the performance of a company will only have an impact on performance so that performance measurement is usually only carried out on the financial aspect. However, the assessment of the financial aspect itself can be biased. Due to performance good finance in a period can be achieved at the expense of the long-term interests of the company. On the other hand, the financial performance unfavorable in the short term can occur because the company makes investments for long-term interests. To solve this problem, the company should input non-financial aspects as well.

One of the right business performance measurements is the Balanced Scorecard, this measurement strategy is a design tool which able to unite existing perspectives to achieve the vision formed by the company. In order to make this strategy run effectively,

it requires consideration of the financial perspective, internal business perspective, customer perspective, and learning and growth perspective.

The advantages of the balanced scorecard include helping companies determine their future vision early, less tangible items such as improved customer service or a higher degree of competitiveness. It is also prescribing that the benefits and risks be separated in business and technology domains.

Maga Swalayan 3 is one of the popular swalayan which has a department store and boutique inside. This department store provides clothes, stationary, foods, and daily needs. The building has 3 floors with an office on the top of it for management staff and a main office for the manager. Manager Maga Swalayan approved the evaluation related to this topic because he felt that the company's performance was still considered inefficient due to intense competition in this era, goods purchased as warehouse stock were deemed not to match the sales figures. Therefore, this research will examine the company's performance with the Industry 4.0 Concept-Based Balanced Scorecard

1.2 Problem Formulation

Based on the description in the background above, the problem that comes up in this research would be formulated and generates a research question as follows:

1. What is the result of evaluation performance using the Industry 4.0 Concept-Based Balanced Scorecard at Maga Swalayan?
2. How is the readiness result based on transparency pillars industry 4.0 at Maga Swalayan?

1.3 Objectives of Research

The objectives of the research can be summarized as follows:

a. Identifying the financial perspectives measures, customer perspectives measures, internal business processes measures, and learning and growth perspectives measures using the balanced scorecard technique.
b. Identifying the integrated values between Balanced scorecard and Industry 4.0
c. Identifying implementation of 4 pillars in Maga Swalayan.

1.4 Scope of Problem

The scope of a problem is a restriction or limitation of problems to make a border in the research to keep the research inside the scope. There are some limitations as follows:

1. This research uses Balanced Scorecard method to analyze the problem.
2. The research was conducted in Maga Swalayan main store.

1.5 Benefit of Research

The expected benefits from this research are:

a. For the Student

   Enlarge the knowledge of Balanced Scorecard technique and Industry 4.0 for the students in order to develop the background of balanced scorecard method and steps to conduct research using BSC method.

b. For the Institution

   This research become a direction and instruction for the Maga Swalayan to know the company's performance based on 4 perspectives of BSC. The company is able to conduct a further evaluation of other opportunities using BSC method.

c. For Society

   This research is expected to be used as a reference for the readers to be more familiar with the literature on several definitions and readers are able to conduct another research using BSC method and Industry 4.0.

1.6 Systematical Writing

Writing this study was based on the rules of scientific writing in accordance with the systematics as follows:

Chapter II LITERATURE REVIEW

This chapter describes the inductive and deductive study. An inductive study is a literature review derived from journals. The deductive study is the basic theory that correlates with the research.

Chapter III RESEARCH METHOD

This chapter is about research methodology, object, and place of research, model development, data requirement, and technique for collecting analyzing data.

Chapter IV DATA COLLECTION AND PROCESSING

This chapter describes the data collection and the process of data. All data and figures will be shown and explained in this chapter.

Chapter V DISCUSSION

This chapter is about the analysis of the problems, derived from problems formulation, research purpose, and data collection.

Chapter VI Conclusion and Recommendation

This chapter contains the conclusion and recommendation. The conclusion is the brief and precise statements that describe the results of research and the suggestions based on the experience and considerations of the author and the researchers with the same fields, and for those who want to continue this current research.

REFERENCES

APPENDIX

CHAPTER II

LITERATURE REVIEW

This chapter discusses literature review which is divided into two, Empirical study and Theoretical study. The empirical study is a study from previous reputable research whereas Theoretical study is a study that would be explained about the basic theory that has relation with research that would be conducted from the text books, etc. Empirical and Theoretical study need to be done to find out the gap between the previous study and the research that would be conducted and also to be done to avoid plagiarism. The literature review aims to identify the state of the art. This literature review will be divided into several sub-chapters.

2.1 Empirical Study

Research about balanced scorecard was conducted with (Abolfazl Danei, et al., 2014) the survey measures an administration unit in Iran based on balance scorecard technique. Based on 4 perspectives stated by Kaplan and Norton, the administration performs poorly in terms of learning and growth instead of financial perspective, customer perspectives, and internal business processes. Kano model is designated to prioritize 13 different components detected by the balanced scorecard. The results of survey using balanced scorecard tell the administration unit to properly use information technology in general service offices, to improve the employees' skills and communication in the offices

Furthermore, there is research using balance scorecard technique in a small and medium-size manufacturing organization conducted by (Kiran Jude Fernandes, et al., 2006) based on this research, the authors highlighted the ambiguity of the BSC concept in the theoretical literature and provides a structured, unbiased and methodological approach to implementing BSC within SMEs using an exemplar from an SME manufacturing organization. The authors used several case studies, video clips, and group discussions to exemplify the balance scorecard benefits. As a result of this effective strategy, over 90% of the employees, were convinced about the advantages of implementing BSC. The research identifies a number of critical management challenges in the BSC implementation activities; such as KPI analysis, project management, and developing support systems. A number of finding from the research may be helpful to other SMEs and strategy makers for successfully institutionalizing BSC within their organizations.

Another research shows the flexibility of Balanced scorecard technique for improving the shortcoming of financial-concentric measures in an oil company, BSC designed to broaden managers' vision by guiding their attention to wider aspects of the company's operations. As an effective holistic performance measurement system, BSC provides a strong causal linkage to connect the multiple levels between non-financial and financial measures. The author's using a balanced scorecard as a framework to integrate and complement Kaizen-Six Sigma and Balance Scorecard. Nevertheless, the balance scorecard system is an effective framework to describe the strategy for creating value and a powerful tool to manage the execution of that strategy. In other words, Balance Scorecard and Kaizen-Six Sigma can be integrated as one combination module for searching excellence because the former provides the concrete context for targeted strategic initiatives and the last is a scientific improvement methodology that can improve performance significantly. In this case, BSC demonstrates a concrete management tool to convert company vision into strategies that will be able to monitor the performance of Kaizen-Six Sigma. This paper has proven that the integration of BSC and Kaizen-Six Sigma could be effectively improving the company's performance. This paper also shows that the integration could reveal an interaction between BSC and Kaizen-Six Sigma and prove to the Company performance management that the people perspective (learning

and growth) is the foundation. The company should add people's perspectives (learning and growth) in their performance management. It also aligns with the company mission, *"compliance"*, where in the oil and gas industry there are a lot of standards and regulations that have to follow and fulfill. The skill that needs a certificate not only relies on the certificate but also regular checks and testing to ensure fluency (Amri, 2014).

On the supply chain aspect, a well-defined lean supply chain measurement system increases the chance for success because it enables managers to see areas where supply chain performance can be improved, so they can focus their attention, and obtain higher levels of performance. There are a number of conceptual frameworks and discussions on supply chain performance measurements in the literature, however, there is a lack of empirical analysis and case studies on performance metrics and measurements in the supply chain environment of Small and Medium-Sized Enterprises (SMEs). This research aims to develop a conceptual framework for managing LSC, integrating both financial and non-financial performance dimensions and so it expands the existent knowledge and provides an indication of how LSC performance can be assessed and improved in this and other kinds of organizations (Hugo Afonso and Maria do Rosário Cabrita, 2015).

The balanced scorecard is a foundation for the strategic management of information systems, this study develops a balanced scorecard for information systems (IS) that measures and evaluates IS activities from the following perspectives: business value, user orientation, internal process, and future-readiness. Case study evidence suggests that a balanced IS scorecard can be the foundation for a strategic IS management system provided that certain development guidelines are followed, appropriate metrics are identified, and key implementation obstacles are overcome. Building upon this viewpoint, IS can be evaluated in terms of (1) the efficiency of the activities associated with IS development and operations (2) Its contribution to the effectiveness of those that use IS to improve personal productivity and strive to help attain corporate goals. The balanced IS scorecard integrates these two dimensions. Efficiency is most directly addressed by the internal processes perspective while effectiveness is addressed by the business value and user orientation perspectives. Significantly though, the future readiness perspective in this research framework adds a dynamic and strategic dimension

to earlier IS evaluation models by recognizing the importance of innovation and learning (Maris Martinsons, et al., 1999)

Another research has a goal to deal with the analysis of the concept of Balance Scorecard and performance measurement in a Tourism company using the case study method. This paper analyzes the theoretical and practical approach of strategic BSC tools, analyzing every advantage and disadvantage, area that can be applied and procedures followed in hierarchical order when applied to industry. Supported with S.W.O.T analysis to produce a combination of possibilities and opportunities that can take advantage of existing opportunities to improve the industry (Nikos Kartalis and John Velentzas, 2013)

The balanced scorecard as an integrated model applied to the public service, the objective of this research is to propose and implement a management tool (BSC) suited for the needs of the Public Administration (PA) service in the waste sector. The BSC was applied with four perspectives, namely clients, internal processes, learning and growth, and finances. Results indicate an overall management performance of 52.45%, which was considered a good result since it was the first implementation approach. Out of the four BSC perspectives, the learning and growth perspective (15% weighting of overall management performance) and the financial perspective (10% weighting) had the smaller achievement performances, of just 4% and 1.75% of the indicators achieved, respectively. The internal process perspective (50% weighting) and the client perspective (25% weighting) had higher achievement performances at 34.2% and 12.5%, respectively. Overall, in the Public Administration service, the BSC is able to contribute to the precepts of modern public waste management, focus on the strategic management of the client-customer relationship, guarantee the best combination of improvement in service, through monitoring and follow-up process, and achieve management objectives. (Paula Mendes, Ana Carina Santos, et. al, 2012)

(D'souza, 2007) looked for ways for Barclays Bank can implement a strategy using a balance scorecard technique across its business. The study established that Barclays Bank had indeed used the balanced scorecard framework to provide a connection between strategy business performance and individual employee performance. The bank had extended the balanced scorecard to reward, recognize

individual performance, provide incentive compensation plans and align individual objectives towards a common goal. The BSC was firmly embedded in everyday work making strategies implementation everybody's business and directing the organization in one direction.

In other studies about the balanced scorecard approach, (Rajat Bhagwat and Milind Kumar Sharma, 2007) this paper develops a balanced scorecard for supply chain management that measures and evaluates everyday business operations based on 4 perspectives: financial perspectives, customer perspectives, internal business processes, and learning & growth. A balanced scorecard has been developed a comprehensive review of literature on SCM performance measures, supported by three case studies, each illustrating ways in which BSC was developed and applied in small and medium-sized enterprises (SMEs) in India. The paper further suggests that a balanced SCM scorecard can be the foundation for a strategic SCM system provided that certain development guidelines are properly followed, appropriate metrics are evaluated, and key implementation obstacles are overcome. The balanced scorecard developed in this paper provides useful guide for the practical managers in the evaluation and measuring of SCM in a balanced way and proposes a balanced performance measurement system to map and analyze supply chains. While suggesting balanced scorecard, different SCM performance metrics have been reviewed and distributed into four perspectives. This helps managers to evaluate SCM performance in a much-balanced way from all aspects of a business.

Modern industry development has lasted for several hundred years and has now the era of Industry 4.0 comes. The phenomenon of Industry 4.0 was mentioned in the German language for the first time in 2011 in Germany, during the "Hannover Fair" event as a proposal for the development of a new concept of German economic policy based on high technology strategies, symbolizing the beginning of Fourth Industrial Revolution (F.Mosconi, 2015)

In essence, Industry 4.0 will involve the technical integration of CPS into manufacturing and logistics and the use of the Internet of Things and Services in industrial processes. This will have implications for value creation, business models, downstream services, and work organization (Kagermann H., Wahlster W., Helbig J., 2013)

Yet while the high anonymity of digital communication increases price transparency, it can also end long-established business partnerships. Therefore, many SMEs are shifting their value capture logic to a customer-oriented one, understanding that the importance of customer retention is intensified through Industry 4.0 (Wu J., et. al., 2013)

Thus, Industry 4.0 relates to the interconnection of different functions within the supply chain, also based on the usage of artificial intelligence (Kagermann et al., 2013). This enables a much higher degree of transparency and efficiency in transactions compared to the third Industrial Revolution and brings new questions to the already established debate on cyber security.

According to (M. Hermann, et al., 2016), the Industry 4.0 concept can be understood as a collaborative term for technologies and concepts that embrace the whole organizations' value chain. This author, whose theory emphasizes the smart factory vision and the integration between its elements along the value chain through the use of key technology enablers, has identified four key aspects of Industry 4.0: (1) CPS, (2) IoT, (3) IoS, and (4) Smart Factory. In the industry 4.0 framework, smart factories are organized by a modular structure, whose processes are controlled and monitored by CPS, that make decentralized decisions.

Industry 4.0, the fourth industrial revolution, has attracted much attention in recent literature. It is closely related to the Internet of Things (IoT), Cyber-Physical System (CPS), information and communications technology (ICT), Enterprise Architecture (EA), and Enterprise Integration (EI). Despite of the dynamic nature of the research on Industry 4.0, however, a systematic and extensive review of recent research on it is has been unavailable. Accordingly, this paper conducts a comprehensive review of Industry 4.0 and presents an overview of the content, scope, and findings of Industry 4.0 by examining the existing literature in all of the databases within the Web of Science. Altogether, 88 papers related to Industry 4.0 are grouped into five research categories and reviewed. In addition, this paper outlines the critical issue of the interoperability of Industry 4.0 and

proposes a conceptual frame- work of interoperability regarding Industry 4.0. Challenges and trends for future research on Industry 4.0 are discussed (Lu, 2017).

Table 2.1 Previous Study relate to BSC and Industry 4.0

NO	Writer	Method	Variable
1	Abolfzal Danei, et al.	Kano model to prioritize 13 different components detected by balanced scorecard	Learning and growth, Financial perspective, Internal Business Process, and Customer perspective
2	Kirain Jude Fernandes, et al.	Exemplar from an SME manufacturing organization	KPI analysis, project management, and developing support systems
3	Amri	BSC integrated with Kaizen-Six Sigma	Learning and Growth
4	Hugo Afonso and Maria do Rosario Cabrita	BSC	Financial and non-Financial performance
5	Nikos Kartalis and John Velentzas	BSC support S.W.O.T.	Financial and non-Financial performance
6	Paula Mendes, et al.	BSC	Customer relationship, internal process, learning and growth, and financial perspective
7	D'Souza	BSC	Employee performance
8	Rajat Bhagwat and Milind	SCM scorecard	SCM performance (financial, customer, internal business process, and learning growth perspectives)

	Kumar Shamar		
9	Mosconi F.	Reviews Literature	Phenomenon of Industry 4.0
10	Kagermann H., Washlter W., Helbig J.	CPS into manufacturing and logistics	Value creation, business models, downstream service, and work organization
11	Wu J., et al.	Customer retention level	Digital communication, price transparency, business partnerships
12	Kagermann, et al.	Transparency and efficiency	Artifical intelligence and cyber security
13	M. Hermann, et al.	Smart factory vision	IoT, CPS, Smart factory
14	Lu	Literature and Database within the web of science	IoT, CPS, Information and Communication Technology (ICT), Enterprise Architecture (EA), and Enterprise Integration (EI)
15	Agung Asaba	Industry 4.0 Concept-Based Balanced scorecard	Financial, Internal Business Process, Learn and Growth, Customers, and 1 pillar of Industry 4.0

2.2 Theoretical Study

2.2.1 Measurement

Measurement refers to the process by which the attributes or dimensions of some physical objects are determined. When used in the context of learning, it would refer to applying a standard scale or measuring device to an object, series of objects, events, or conditions, according to practices accepted by those who are skilled in the use of the device or scale.

Based on the statement (Tripathi R. & Kumar A., 2018) in quoting the definition provided by James M. Bradfield state that measurement "is a process of assigning symbols to the dimensions of a phenomenon to characterize the status of the phenomenon as precisely as possible". This means that measurement entails subjecting a phenomenon or variable to some precise and quantifiable yardstick(s).

2.2.2 Evaluation

On the other hand, evaluation is a more complicated and less understood term. A simple explanation about evaluation, making judgment or determination of the quality or worth of an object, subject, or phenomenon can be referred to as evaluation. Evaluation is an ongoing process, which starts with the development of an initiative and continues throughout the life of a project and beyond. Definition of evaluation based on (Kelter, 2018), evaluation is a process of data collection to determine the worth of a program (current value) to determine the improvement of a program (looking toward the future), he conducted research to determine the goals and objective are meets expectation.

2.2.3 Performance

From different general literature, the definition of performance is an illustration to achieve implementation of programs/policies in realizing the goals, objectives, mission, and vision of organizations that are contained in the strategic planning of an organization (Mahsun, 2006). Performance appraisal is actually an assessment of human behavior in carrying out the roles they perform in a company, performance appraisal can be carried out by periodically determining the operational effectiveness of an organization and its employees based on the targets of standards and criteria previously set by the company (Mulyadi, 2001).

2.2.2 Balance Scorecard

The balanced scorecard was developed in the early 1990s by Dr.Robert Kaplan and Dr. David Northon after they recognized some of the weaknesses and obscurity of previous management approaches. Kaplan and Northon suggested four sets of parameters. First,

how do customers see the company? Second, what must a company excel at? Third, can your company continue to improve and create value? Fourth, how has your company been done by its shareholders? They further say that the balanced scorecard lets executives see whether they improved in one area at the expense of another area, which will protect companies from posting non-optimal performance (Kapalan, R.S. and Northon, D. P., 1992).

The balanced scorecard includes financial measures that tell the results of actions taken with the company. It complements the financial measures with operational measures on customer satisfaction, internal processes, and the organisation's innovation and improvement activities – operational measures that are the drivers of future financial performances, that the balanced scorecard provides executives with a comprehensive framework that translates a company's strategic objectives into a coherent set of performance measures. Much more than a measurement exercise, the balanced scorecard is a management system that can motivate breakthrough improvements in such critical areas as product, process, customer, and market development based on the explanation. (Kapalan, R.S. and Northon, D. P., 1992). Many companies are adopting the BSC as the foundation for their strategic management system. Some managers have used it as they align their businesses to new strategies, moving away from cost reduction and towards growth opportunities based on more customized,value-adding products and services explained by (Martinsons, M. Davison, R., & Tse, D., 1999). To translating vision and strategy for the companies, Norton and Kaplan designed this table in order to make it more visible and easy to used, as shown below in Figure 2.1

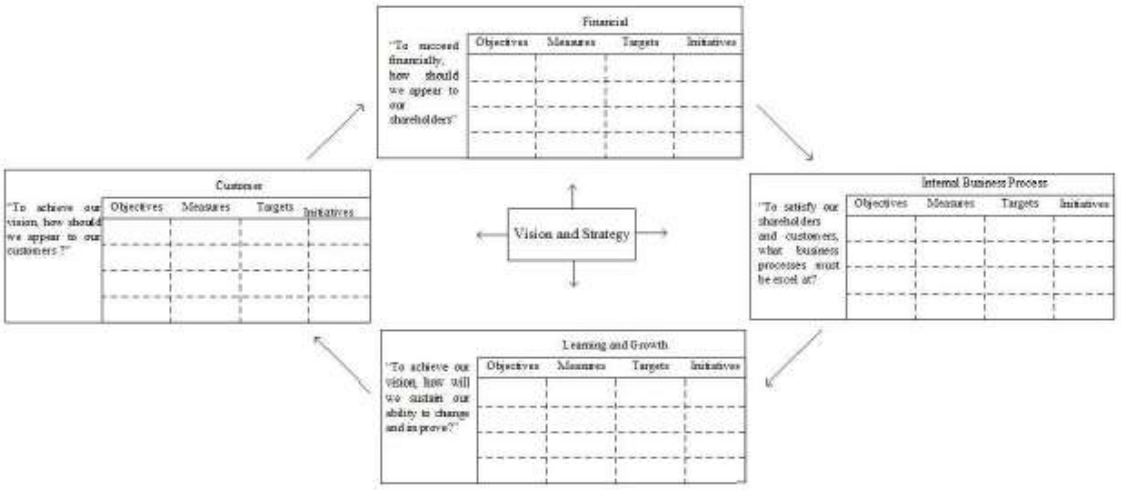


Figure 2. 1 Translating Vision and Strategy Table

2.2.3 Financial Perspective

The Balance Scorecard retains the financial perspective since financial measures are valuable in summarizing the readily measurable economic consequences of actions already taken. Financial performance measures indicate whether a company's strategy, implementation, and execution are contributing to bottom-line improvement. Financial objectives typically relate to profitability measured for example by operating income, return on capital employed, or more recently, economic value added. Alternative financial objectives can be rapid sales growth or generation of cash flows (Kaplan, R. S. and Northon, D.P., 1996).

Financial performance measurement identifies whether the implementation of the company's strategy contributes to bottom-line improvement. The objective of the shareholder's perspective is to maintain life, gain success and prosperity for the company. The size of the financial performance is frequently used is divided into 3 major parts, mentioned:

a. Profitability ratios, which measure management effectiveness based on returns resulting from sales and investments.
b. Growth ratio, which measures a company's ability to maintain its economic position in economic growth and in the industry or market where it operates.

c. Measuring assessment, measuring management's ability to achieve market that exceeds cash expenses.

Financial performance measures show whether strategies, strategic objectives, strategic initiatives, and their implementation are able to contribute and generate profits for the company. Financial measures are generally manifested in profitability, growth, and shareholder value (Mulyadi dan Setyawan, 2001).

2.2.4 Customer Perspectives

From the customer perspective, managers identify the customer and market segments in which the business unit will compete and the measures of the business unit's performance in these targeted segments. This perspective typically includes core or generic measures of successful outcomes from a well-formulated and implemented strategy. The core outcome measures include customer satisfaction, customer retention, new customer acquisition, customer profitability, and market and account share in targeted segments. The segment-specific drivers of core customer outcomes represent those factors that are critical for customers to switch or remain loyal to their suppliers. The customer perspective enables business unit managers to articulate the customer and market-based strategy that will deliver superior future financial returns (Kaplan and Northon, 1996b).

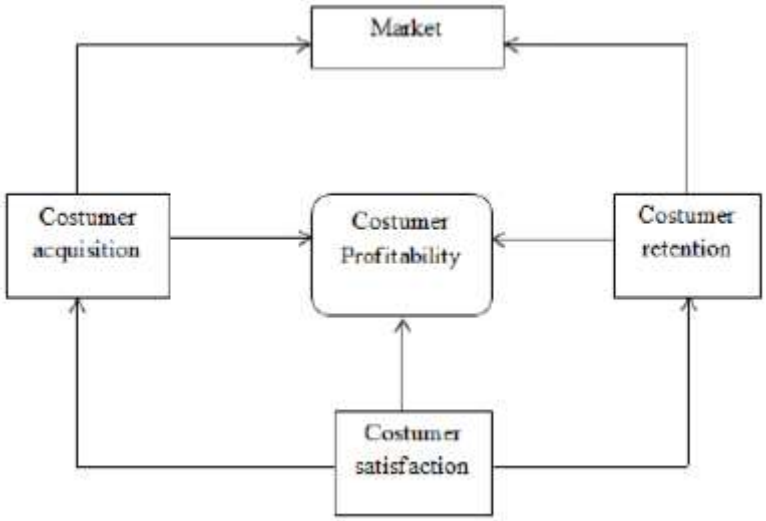
In order to fulfill the satisfaction of customers, customers should be the focus strategy for the company, the organization should depart from the following questions:

a. Who is our customer?
b. What customer needs do we fulfill?
c. What kind of business will satisfy customers' needs?

Customer perspective has 2 measurement groups which are:

a. Customer core measurement has several measurement components, namely:

1. Market share: this measurement reflects the portion that the company controls over the entire existing.
2. Customer Retention: measures the level at which companies can maintain relationships with consumers.
3. Customer acquisition: measures the level at which a business unit is able to attract new customers.
4. Customer satisfaction: estimating the level of customer satisfaction related to specific performance criteria in the value proposition.



Source: Kaplan and Norton (1998)

Figure 2. 2 Value Proposition Diagram

b. Customer Value Proposition

The customer value proposition is a performance trigger found in the core value proposition based on the following attributes:

1. Product/Service attributes

Includes functions of the product or service, price, and quality. Some prioritize the function of the product, quality, or low price. Companies must identify what customers want for the products offered.

2. Customer relationship

Regarding customer feelings towards the process of purchasing products offered by the company. The feeling of consumers is strongly influenced by the responsiveness and commitment of the company to the customer with regard to the issue of delivery time. Consumers usually consider fast and timely order completion as an important factor for their satisfaction.

3. Image and reputation

Describe intangible factors that attract a consumer to connect with the company. Building an image and reputation can be done through advertising and maintaining product quality.

According to Philip Kotler and Kevin Lane Keller quoted from the book Marketing Management (2009), saying that "Customer Satisfaction is the feeling of being happy or disappointed someone who appears after comparing the performance (results) of the product that is thought of the expected performance". Whereas according to Husein Umar (2005), customer satisfaction, among others, is the level of consumer feelings after comparing what he received and expectations.

A customer, if satisfied with the value provided by a product or service it may improve the customer loyalty to the company for a long period. In determining the level of customer satisfaction, five main factors must be considered by the company, which are:

1. Product quality

Consumers will be satisfied if the results of their evaluation show that the products they use are high quality.

2. Service quality

Consumers will feel satisfied while appreciating and getting appropriate service from the person in charge.

3. Emotional

Consumers will feel delightful and get the happiness that other people will be amazed and get influenced when consumer one and other using a certain brand that tends to have a higher level of satisfaction.

4. Price

Products that have the same quality but set relatively cheap prices will provide a higher value to consumers.

5. Cost

Consumers who do not need to incur additional costs or do not need to waste time getting a product or service tend to be satisfied with the product or service.

2.2.5 Internal Business Process

From the internal business process perspective, executives identify the critical internal processes in which the organization must excel. These processes enable the business unit to:

a. Deliver the value propositions that will attract and retain customers
b. Satisfy shareholder expectations of excellent financial returns

The internal business process measures focus on the internal processes that have the greatest impact on customer satisfaction and achieving an organization's financial objectives. It reveals two fundamental differences between the traditional and the BSC approaches to performance measurement (Kaplan and Northon, 1996b). Differences in internal business perspectives between traditional approaches and balanced scorecard approaches are:

a. The traditional approach seeks to oversee and improve existing business processes. In contrast, the approach using balanced scorecard has the objective to recognize all the processes needed to support the success of the company's strategy, even though those processes have not been implemented.

b. With the traditional approach, performance measurement systems are only centered on how to deliver goods or services. Whereas in the balanced scorecard approach the innovation process is included in the perspective of internal business processes in order to give customer satisfaction and achieve an organization's objectives.

Kaplan and Norton divide internal business processes into three parts, namely:

a. Innovation Process

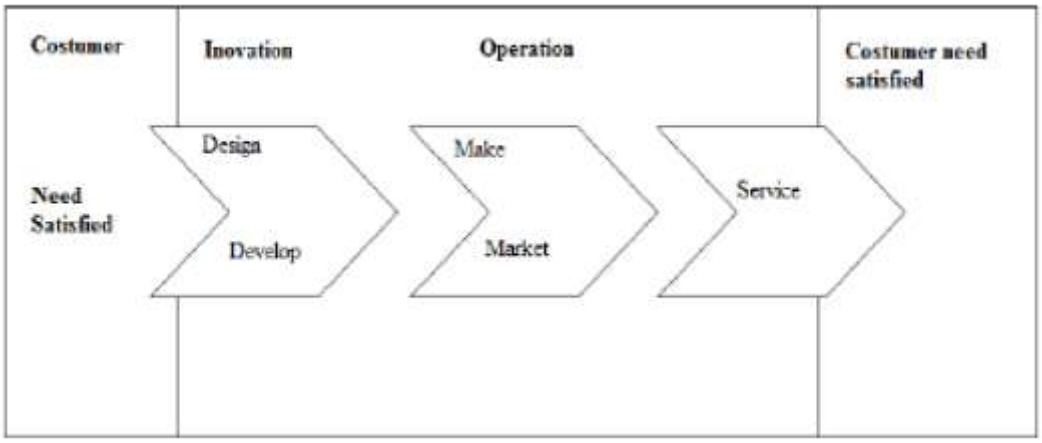
In this process, business units explore an understanding of the needs of customers and create the products and services

b. Operation Process

Activities in the operation process are divided into two parts : the process of making products and the process of delivering products to customers. Performance measurements related to operating processes are grouped in time, quality and cost.

c. After Sales Process

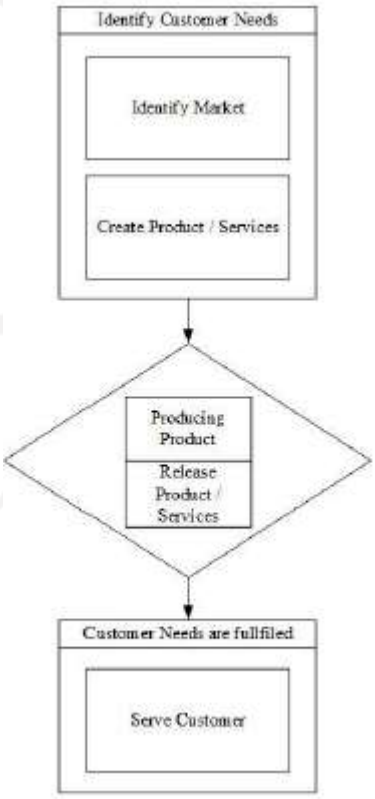
This activity includes the collection, storage, and distribution of products or services and after-sales services where the company seeks to provide additional benefits to customers who have purchased their products, such as product maintenance services, warranty handling, repair handling of damaged goods, and returned and customer payment processing.



Source: Kaplan and Norton, 2000

Figure 2. 3 Principles in the internal business process perspective

In general, benchmarks in this perspective focus on internal processes that have the greatest impact on customer satisfaction and achieve the financial goals of the organization. For more details, the sequence will be described in the picture below:



Source: Kaplan and Norton, 2000

Figure 2. 4 Internal Business Process Concept

According to Fandy Tjiptono (2002), there are ten dimensions in service quality which are summarized into five main dimensions. The five main dimensions include:

a. Tangibles

   Display of physical facilities, equipment, employee appearance, and communication materials from these services.

b. Reliability

   The ability to provide services as promised reliably and accurately.

c. Responsiveness

   The ability and willingness to respond to requests/complaints from consumers quickly and satisfactorily.

d. Assurance

   Guarantees of the services they provide so that consumers trust the service providers.

e. Empathy

   Personal attention is given by the company to its customers.

In this perspective, every statement on the questionnaire uses indicators found in service quality, including attributes Tangibles, Reliability, Responsiveness, Assurance, and Empathy.

2.2.6 Learning and Growth

The learning and growth perspective identifies the infrastructure that should be built in creating growth and long-term performance improvement. This perspective comes from the factors of human resources, systems, and organizational procedures. One measure used according to (Kaplan and Northon, 2000, pp. 112-114) is worker productivity, which is a measure of results, the overall impact of efforts to increase employee morale and

expertise, innovation, internal processes, and customer satisfaction. Formula to identify the learning and growth as follows:

$$\text{Human Resources productivity} = \frac{\textit{Number of customers}}{\textit{Number of Workers}} \ldots\ldots\ldots\ldots \quad (2.1)$$

The aim of the learning and growth perspective is to provide infrastructure to support the achievement of the three previous perspectives. The results from the measurement of the three previous perspectives will usually show a large gap between the capabilities of people, systems and existing procedures with those needed to achieve the desired performance. Factors that must be considered are:

a. Employee

Things that need to be reviewed are employee satisfaction and employee productivity. To find out the level of employee satisfaction, companies need to conduct regular surveys. Some elements of employee satisfaction are the involvement in decision making, recognition of access to information, encouragement to do creativity and initiative, and support from superiors. Work productivity is the result of the aggregate influence of increasing moral expertise, innovation, internal process improvement, and the level of customer satisfaction. In assessing the work productivity of each employee, it needs continuous monitoring.

b. Information System Capability

Companies need to have information procedures that are easy to understand and carry out. A benchmark that is often used is that the information needed is easy to obtain, precise and does not require a long time to get the information.

c. Retention Employee

Previous research has identified several factors that have an influence on employee retention. The first important indicator of employee retention is their organizational commitment (Curtis S. and Wright, 2001). Employees with a high motivation to maintain organizational commitment are those who have a strong identification

with the organization, value the sense of membership within it, Employee retention: organizational agree with its objectives and value systems, are likely to remain in it and, finally, are prepared to work hard on its behalf.

Employee job satisfaction is basically one of the psychological aspects that reflects a person's feelings towards his job, he will feel satisfied with the suitability between abilities, skills, and expectations with the work he faces (Susilo Martoyo, 1992). Satisfaction is actually a subjective condition that is the result of a conclusion based on a comparison of what employees receive from their work compared to what was expected, desired, and thought of as appropriate or entitled to it. According to (Morse, 1997) "Satisfaction refers to the level of fulfillment of one's desires. Satisfaction depends basically on what an individual wants from the world, and what he gets."

From the restrictions regarding job satisfaction, it can be concluded simply that employee job satisfaction is one's feeling towards his job. This means that the conception of job satisfaction sees it as the result of human interaction with the work environment. In addition, one's feelings towards work are at once a reflection of their attitude towards work. Basically, job satisfaction is an individual thing. Each individual will have a different level of satisfaction in accordance with the system of values in force in him. This is due to differences in each individual. The more aspects of the work that are in accordance with individual desires, the higher the level of satisfaction felt.

Some indicators that can affect employee job satisfaction include:

1. Satisfaction with his own work

   An employee will be satisfied with the work is doing if he meets the following:

   a. The work is considered as something important and has benefits
   b. Employees are aware of their duties and responsibilities for the results of the work done.
   c. Employees can ensure that their work is able to achieve the value of satisfaction.

Also, job satisfaction results from a person's view of their job. This is based upon work environment conditions such as the mentality of seniors/supervisors, company policies and processes, working conditions, and additional benefits (Gibson J., Ivancevich J., & Donnelly J., 1979).

2. Satisfaction with salary

A fair and equal pay system would encourage job satisfaction (Lawler, 1981). Further, he says things such as bonuses and annual salary increments would more encourage employee job satisfaction. To this study, pay is defined as employee pay, which is adequate for their normal expenses. Hence compensation is the main indicator of the dimension of payment. Apart from that, it covers bonuses and salary increments also. The employee is satisfied with the pay and pay is provided according to the working experiences and equal to the work done. Several practical studies have found a strong positive link between employee payment and job performance (Armstrong, 1998).

3. Satisfaction with promotion

Promotions can be considered as a tool by management for increasing employees' motivation and job satisfaction levels. Position advancements, generating positive morale among employees, and ensuring job security had a great potential of creating employee job satisfaction (Gouws, 1995). It should be noted that those who may receive promotions in an unfair manner, perhaps through known connections are likely to create rifts among the genuine workers. This in turn can create job dissatisfaction. In the context of this study, promotion is defined as the fair chance for the employee to get promoted. Advancement, morale, value, and security were considered as the indicators of the dimension promotion. Positive promotion aspects elevate levels of job satisfaction and that will increase employee job performance (Gouws, 1995).

4. Satisfaction with leader

Another indicator that affects employee job satisfaction is satisfaction against superiors. Employees should be bonded with superiors to achieve the company's vision and maintain effective performance. One of the ways to create a strong bond

and relationship with superiors is to have a good subordinate relationship and ensure that superior's value the employee's contribution. Therefore, the management of the company should encourage employees to take new initiatives on their own and to stand by their side even if these initiatives may sometimes lead to failure.

5. Satisfaction with co-workers

Work performance in each department will improve if co-workers can be trusted and provide good support. The extent to which employees believe their co-workers will have an impact on the efficiency of work completion time and accuracy in completing tasks from superiors. Coworkers influence the working environment, and this influence will affect employee attitudes at work. Coworker support is an important source of employee support in service organizations (Susskind, et al., 2003).

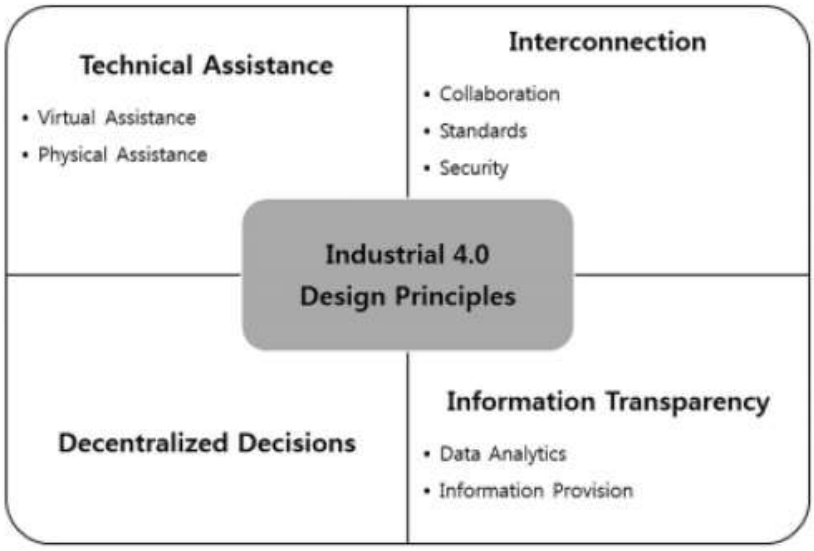
The employee job satisfaction attribute above becomes an indicator in determining each question from the perspective of growth and learning. Due to the limited information and data obtained, the attributes used as indicators in this perspective questionnaire are satisfied with the work itself, satisfaction with colleagues, satisfaction with superiors.

2.2.7 Industry 4.0 Measurement

The terms Industry 4.0 was born from the idea of the fourth industrial revolution. The European Parliamentary Research Service. Davies (2015) stated that the industrial revolution took place four times. The first industrial revolution occurred in England in 1784 where the invention of steam engines and mechanization began to replace human work. The second industrial revolution occurred at the end of the 19th century where the production machines supplied with electricity were used for mass activities. The use of computer technology for manufacturing and automation became the sign of the third industrial revolution. At this time, the improvement of sensor technology, inter-connections, and data analysis made a new idea to integrate all of the technologies into the industry sector. Based on this idea, it will come to make the next level of industry and number 4 will direct as the fourth revolution.

In general, Industry 4.0 encompasses the development and integration of innovative information and communication technologies into the industry. The main goal is to foster the intelligent networking of products and processes along the value chain, thus allowing it to use more efficiently the organizational processes, into the creation of goods and services to enhance customer benefit offering them novel products and services. These related changes in the industrial sector are seen as a comprehensive paradigm, currently named as the fourth industrial revolution: Industry 4.0 (Reiner, 2014).

(Hermann et al., 2017) suggest four design principles for Industry 4.0 based on a four-step research phase: first, identify relevant literature; second, conduct a quantitative text analysis; third, publish a qualitative literature review; and, fourth organize a nominal group workshop. Here are the Industrial 4.0 design principles made by (Hermann et al. 2016).



Source: Hermann et al. (2016)

Figure 2. 5 Industrial 4.0 Design Principles

The basic principles of Industry 4.0 applied to production as follows:

1. Interoperability, or the ability of the CPS, persons, and all other components of smart factories to communicate together using dedicated networks.

2. Transparency definition in business is the basis for trust between a firm and its investors, customers, partners, and employees. Being transparent means being honest and open when communicating with stakeholders about matters related to the business. Transparency in business can take many different forms depending on the nature of the communication and which stakeholders are involved, but the core objective is always the same to establish trust and goodwill by building and preserving the firm's reputation for openness and honesty in its business dealings. Transparency in the supply chain needs networks and optimal results, especially in inventory. Warehouses are not always conveniently available because buffer storages need to be located near the installation site. Instead, a temporary storage location must be set up, often without inventory management systems (Ala-Risku, T. and Ka¨rkka¨inen, M., 2006). Even in situations where the storage location is equipped with inventory control systems, the short-term nature of the project mitigates against undertaking systems integration efforts that could provide transparency to the storage location on the project or supply chain level (Dainty, A.R.J., Briscoe, G.H. and Millett, S.J., 1999).

3. Based on the background paper (INDUSTRY 4.0 OPPORTUNITIES BEHIND THE CHALLENGE, 2017), To achieve these pillars, the company should emerge platforms, such as the IoT and the Industrial Internet, it will influence the formation of future smart connected environments, including smart cities. This will cut several challenges that will need to be addressed through the competition of a sustainable industry 4.0 governance model: ensuring control of information, networking privacy, the safety of confidential data, and transparency towards all supporting environments.

4. Decentralized decisions, the ability of cyber-physical systems to make decisions on their own and to perform their tasks as autonomously as possible. Only in the case of exceptions, interference, or conflicting goals, are tasks delegated to a higher level.

5. Technical assistance, Visual and physical assistance. The ability of assistance systems to support humans by aggregating and visualizing information comprehensibly to make informed decisions and solve urgent problems on short notice and the ability of cyber-physical systems to physically support humans by conducting a range of tasks that are unpleasant, too exhausting, or unsafe for their human co-worker.

Based on these 4 principles, industry 4.0 can provide benefits for all types of businesses to develop by following current technological developments. In terms of these, industry 4.0 is able to provide flexibility for data flow, reduce lead times during production, customize batch sizes, also possible to reduce costs because take advantage of digital technology. (S.I. Shafiq et. al., 2015).

Readiness industry 4.0 can be measured at the beginning before the company adopts an innovation withthe purpose to follow the industry 4.0 trend. Measurement of readiness measures the individual or organization has sufficient knowledge and skills regarding the resources needed to start a process (Viharoz, 2017). Readiness can be measured qualitatively or quantitatively, discretely, or continuously (Kohlegger, M., Maier, R. and Thalmann, S.,, 2009). Measurement of readiness takes place before the maturity process starts. While the measurement of maturity objectives to capture the state as it is while in the ongoing maturation process.

CHAPTER III

RESEARCH METHOD

In this chapter, there will be an explanation about the research methodology that can be divided into:

3.1 Research Objective

The objective of this research is to evaluate the business performance Maga Swalayan at DI Panjaitan No.54 street using Balanced scorecard that integrates with industry 4.0 in this era. This research uses 4 perspectives which are financial perspectives, customers perspectives, internal business processes, and learning and growth perspectives which have been correlated with values that support the development of the current 4.0 industry at this time.

3.2 Research Flow

There are several stages to conduct this research, the first step is the problem identification done by the researcher continued by determining the research question and research objectives. The literature review consists of an inductive study that explained the previous research that has been done in the past and a deductive study that explained the basic theory of performance measurement, balanced scorecard, and industry 4.0 concept. The next step is data collection and will be processed in data processing. The data that has been collected will be processed using the balanced scorecard method

3.3 Flowchart Research

The research framework is constructed as the flowchart which shown in Figure 3.

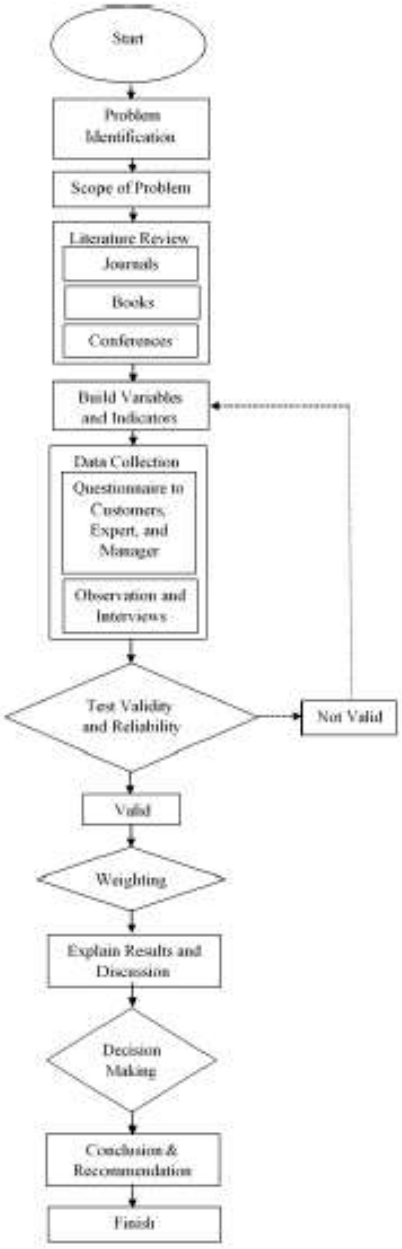


Figure 3. 1 Process Flowchart of The Research

The description of the research methodology flowchart in Figure 3.1 above will be explained as follows:

3.4 Types of Data

The source of data used in this research consisted of primary data and secondary data:

a. Primary Data

Primary data is data obtained directly from the object of research which is Maga Swalayan. The primary data of this research were obtained from the interview with experts especially the head of the department of human resources, head department of the warehouse, and owner of Maga Swalayan, on-site observations in Maga Swalayan by observing the facilities, layout, and office, and questionnaires answered by customers, employees, and superiors at Maga Swalayan.

b. Secondary Data

The secondary data is data get from differents literature such as journals related to the research, textbook that explained about BSC itself and describe pillars of industry 4.0, and information obtained through the internet and other references. The secondary data used for the data supporting this research in order to keep the originality of information resources and help the research on track.

3.5 Data Collection Method

Research needs to collect the data before processing the data. The method of collecting data is as follows:

1. Literature Review

To support this research, a literature review is needed. It can be obtained from books, websites, journal articles, or book sections related to this research especially balanced scorecard topics and industry 4.0 concepts. There are 15 references to fulfill the requirement of literature review and based on the references there are a variety of methods and indicators used by the expert for analysis and this research, the indicator and method will be explained in the research method.

2. Interview

   To gain all information, which related to this research, the researcher conducts an interview. The interview was performed with the customers, employees, heads of departments and managers in the company. The interview itself takes around 15 minutes – 1-hour duration and takes a random sample for customers, but for the expert, this research chooses the head department of the warehouse, human resource, finance, and the owner of Maga Swalayan.

3. Questionnaire

   To fulfill the Balance Scorecard evaluation, the researcher needs to gather information from the expert. The suitable method to gather information for this method is by questionnaire.

3.6 Data Processing

In this section, every single piece of data collected will be processed using Microsoft Excel and SPSS as an instrument of this research. The result will show as a valid value of the weighting for each perspective in the balanced scorecard method.

1. Problem identification

   At this stage, an introduction to the problems faced is then arranged in sentence formulations with language that is easier to understand, simplification of the problem that covers the entirety of research, and the problem identification should be ideal and appropriate with the situation happened at Maga Swalayan. For this research, the problem identification is based on the condition at Maga Swalayan.

2. Scope of Problem

   At this stage, clarifying the scope of the research is important, setting limitations on the research conducted with the considerations used by the researcher.

3. Literature Review

   At this stage, the aim is to collect relevant information that can be used for further research, both in the form of theoretical concepts and previous studies by other researchers. The results of this literature study can come from different resources such as textbooks, articles of journals, book sections, internets, and other research.

4. Data Collection

   At this stage, the aim is to collect data to fulfill the requirement for data processing so the problem can be resolved properly. The data are collected by using a questionnaire, which was distributed to employees and customers at Maga Swalayan. There is an interview as well with one expert in Maga Swalayan who is in charge with the student who works on the thesis.

5. Processing Data

   At this stage, the data that has been collected is processed using balanced scorecard method to get proper results. The first step is defining the 4 perspectives used for analysis. This research decided to analyze financial, internal business process, learning and growth, and customers perspectives. After deciding the perspectives there is classification about variable and indicator used for weighting and decision making whether the Maga Swalayan should improve or maintain the performance. The distributed questionnaires have been formed based on the appropriate variables and indicators so that the data to be used is valid and reliable. After the data is processed, the researcher will continue to test the validity and reliability to find out the data is valid and reliable.

6. Validation

   Validation is used to find out whether the data that has been processed is appropriate or not. If the processed data are not yet valid, data collection is carried out again to get a valid result. The validation itself uses SPSS software as media of analysis and reliability to make sure the data collection is valid and

can be used for analysis. There are indicators for customers' perspectives, employee performance index, and employee satisfaction.

7. Transparency readiness measurement

   Model readiness is designed for deciding the current state of the employee, there 4 dimensions used for this research, which are, accessibility, flexibility, accuracy, and comprehensive. Based on this dimension the response from Maga Swalayan will be scaled from 1 – 5 to find out the agreement and the answer will be used as an index calculation. After the index result is found, the next step is making diagram pie and quadrant matrix to make the company easier for making strategy and plan for transparency readiness.

8. Results and Discussion

   The discussion is the stage where the data that has been processed by the balanced scorecard method will be analyzed, there are 4 perspectives that should be described clearly and some numerical results that must be explained well in order to get a proper conclusion at the end. After that researcher should maintain the connection between Industry 4.0 to achieve the vision of the company, there is 1 pillar used for this measurement to accomplish the goals and improve the performance of the company. This research results will lead to the decision making for Maga Swalayan whether the company should improve the important perspective or focus only one or more to maintain the company performance on the positive vision and mission. Based on the results manager can focus on the minimum performance and take decisions easier to improve and maintain the employees and cash flows to get more profit and good performance for the next period.

9. Conclusion & Recommendation

   It is the conclusion of the research and the solution provided after conducting balanced scorecard evaluation and implementation of industry 4.0 concepts, there are several recommendations to the company about improvement in the future based on balanced scorecard analysis.

CHAPTER IV

DATA COLLECTION AND PROCESSION

4.1 Company Profile

Maga Swalayan is a store that has been established for 14 years in Yogyakarta Maga Swalayan markets a wide range of daily necessities, office supplies, schools, fashion, and others. Maga Swalayan has owned another branch in Yogyakarta.

4.1.1 History of Company

Maga Putra Mandiri or better known as Maga Swalayan located on Jalan D.I Pandjaitan No.54 Yogyakarta is the head office that manages all business activities from 7 branches which are mostly located in southern Yogyakarta.

Maga Swalayan was established in 1975 by Mr.H. Wardan Djunaid. The name Maga is derived from the year number which is 53 where that year Mr.H. Wardan Djunaid founded a weaving company called Maga Tex. When the weaving company could no longer develop, it was decided to set up a grocery store business, from this small shop which later became the forerunner of the establishment of the minimarket.

H. Wardan Djunaid died in 1990 in Saudi Arabia while carrying out the Hajj, the shop he founded continued to develop and was managed by Mrs. Hj. Siti Zaidah the wife of the late Mr.H. Wardan Djunaid. In 2002 Mrs. Hj. Siti Zaidah passed away, after her death, then the second generation decided to develop the Maga store into a modern shop with professional management. The sons and daughters of the late H. Wardan Djunaid numbered 8 people, the name Maga itself was also often sketched meaning it stands for five sons and three daughters, taken from the total number of children. In the first son's command, Drs. H. Muhammad Djatmiko, MM. Apt. This legacy company is managed together with a legal entity in the form of PT. Maga Putra Mandiri is thus the name of the family company. By inviting retail consultants from Jakarta in March 2002, Maga's management continued to improve towards professional management and began recruiting experienced HR and still involving families to sit in the management ranks. Until January 2018 Maga has developed into 4 outlets and of course, in the future, Maga will continue to grow both in quantity and quality.

Rapid development after 3 years of establishment, right in 2007, 2009, and 2010 Maga Swalayan built branches in several locations namely Bantul, Parangtritis, and the city center. Until 2018 Maga Swalayan has developed to provide jobs for the people of Yogyakarta to support their families and provide opportunities for all young people to have good work experience. The minimum qualification required to work at Maga Swalayan is a high school graduate who will be positioned as a cashier/salesperson and if the employee has the opportunity to be promoted in one of the departments at Maga Swalayan, the employee will be given the opportunity to attend placement training and eligibility depending available position.

Maga Swalayan center which is centered on Jalan D.I. Pandjaitan No.54 Yogyakarta has 3 floors where the first floor sells all household needs in general, the second floor sells fashion for women, men and children, and 3rd floor is an office for employees who manage all aspects such as resources human, financial, IT, and maintenance.

4.1.2 Vision and Mission

Vision

Realizing Maga Swalayan as a favorite shopping place for families, students, and the surrounding community

Mission

1. Providing quality and always up-to-date products
2. Providing excellent services for customer
3. Providing a working area for unemployment in Yogyakarta
4. Providing development for management system in Maga Swalayan in order to compete with small market

4.1.3 Organizational Structure

Organizational structure is an arrangement and relationship between each part or position contained in a company in order to carry out its operational activities to achieve predetermined goals. And besides that, the organizational structure also shows that there is a division of labor and how different functions or activities are coordinated. Below is an organizational structure from Maga Swalayan.

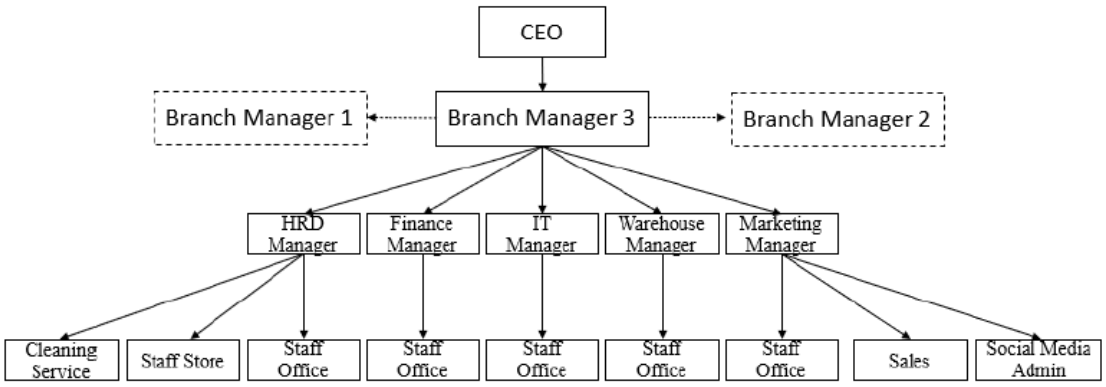


Figure 4. 1 Organization Structure Maga Swalayan

4.2 Data Processing

4.2.1 Demographic Respondent Data

In this study the data was taken in February – March 2019 with a total of 145 respondents, 70 respondents were customers and 75 respondents were employees of Maga Swalayan. Demographic data of respondents studied included gender, age of the respondents, and educations. The results of the distribution of respondents' demographic data can be seen in the table below.

Table 4. 1 Distribution customer satisfaction questionnaire based on gender

Gender	Amount	Percentage
Man	35	50%
Woman	35	50%
Total	70	100%

Based on the data collected by the researcher, there are 70 people distributed based on gender and there are 35 men and 35 women accepted questionnaires related to customer satisfaction which will be analyzed in the next step.

Table 4. 2 Distribution based on age

Age	Amount	Percentage
17-24	24	34,2%
25-32	33	47,1%
33-40	11	15,8%
41-47	2	2,9%
Total	70	100%

Based on the random sampling conducted by the researcher, there is an age classification with the purpose to find out who frequently shop at the Maga swalayan. And it shows that most customers are housewives and teenagers during author's collecting the data.

4.2.2 Demographic Data Employee

Here is the distribution of employees based on gender at Maga Swalayan:

Table 4. 3 Distribution Employee based on gender

Gender	Amount	Percentage
Male	43	57,33%
Female	32	42,67%
Total	75	100%

Based on the table above, there are 43 male employees and 32 female employees who work in several departments in Maga Swalayan. To deliver questionnaires related to learning and growth and employee perspectives.

Table 4. 4 Distribution employee based on age

Age	Amount	Percentage
17-25	22	29,3%
26-35	21	28%
36-45	24	32%
45-55	8	10,7%
Total	75	100%

Based on the table above, 75 employees will be respondents to get valid answers and further analysis for the Author. Distributing based on age is important regarding the level of understanding for each category is different.

Table 4. 5 Distribution employee based on education

Last Education	Amount	Percentage
SMP	12	16%
SMA/SMK	26	34,7%
Academy/D3	20	26,7%
Sarjana/S1	17	22,7%
Total	75	100%

Based on the table above, there are 75 employees who will be respondents to get valid answers and further analysis for the Author. Distributing based on last education is

important regarding to the level of understanding for each category is different and last education deciding the job requirement in Maga Swalayan.

4.2.3 Balanced Scorecard Measurement

Work measurement is done by using four perspectives of the Balanced Scorecard which include financial perspective, customer perspective, internal business process perspective, and growth and learning perspective. At this stage, data are collected relating to matters that affect the performance of Maga Swalayan. Data collection is done by several methods that will support the accuracy of the calculation of company performance. In each perspective, there are several indicators in each perspective cumulative company performance calculations that are more accurate.

4.2.4 Financial Perspective

The financial perspective is the calculation of financial data from the company each period. The goal in this perspective calculation is to know and increase the income and profits that the company gets every period. In this perspective, the author uses financial data obtained from Maga Swalayan. Measurement of financial perspective is done by calculating sales growth in 2016-2018. The data that the author gets, are as follows:

Table 4. 6 Sales and Cost 2016-2018 at Maga Swalayan

YEAR	SALES	COST	NET PROFIT
2016	245.512.300	175.210.600	70.301.700
2017	250.520.450	184.434.700	66.085.750
2018	262.452.340	192.345.900	70.106.440

a. Sales Growth

Sales growth shows the extent to which companies can increase sales compared to total sales overall. Based on Endang and Agus (2010) Sales Growth measure with this model below:

$$\text{Sales Growth}_{2017} = \frac{\text{Sales Year}_t - \text{Sales Year}_{t-1}}{\text{Sales Year}_{t-1}} \times 100\% \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.1)$$

$$= \frac{250.520.450 - 245.512.300}{245.512.300} \times 100\%$$

$$= 2{,}03\ \%$$

$$\text{Sales Growth}_{2018} = \frac{\text{Sales Year}_t - \text{Sales Year}_{t-1}}{\text{Sales Year}_{t-1}} \times 100\% \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.1)$$

$$= \frac{262.452.340 - 250.520.450}{250.520.450} \times 100\%$$

$$= 4{,}76\ \%$$

Table 4. 7 Sales Growth 2017-2018 at Maga Swalayan

Year	Sales Growth
2017	2,03%
2018	4,76%

Based on the result above, the sales growth has developed for period 2017 – 2018, the increase Rp 4.020.690, - is a good achievement for Maga Swalayan 3 and the sales growth for 1 year it takes 4,76%. And the profit growth for 2017 – 2018 is +5,73% based on Table 4.7 below.

Table 4. 8 Profit Growth 2017-2018 at Maga Swalayan

Year	Profit Now (*Net profit – Last Profit*)	Profit Growth (*Net profit – Last Profit*)	Percentage
2017	66.085.750	-4.215.950	-6,37%
2018	70.106.440	+4.020.690	+5,73%

To find out the final score on financial perspectives, weighting is needed based on the weight that has been determined by the company. In this study, the weight used in the measurement of financial perspectives (with profit growth) is 15. The final score can be seen in Table 4.8.

Table 4. 9 Weighting for financial perspectives

Weighting	Target	Realization	Final Score
15	12%	6,37%	7,96
15	12%	5,73%	7,16

b. Employee Salary

This study also collected data related to the number of employees' salaries per month at Maga Swalayan. Employees' salaries vary following their educational background and work experience.

Table 4. 10 Employee salary in 2017 - 2018

Position	2017 (per month)	2018 (per month)	Salary Growth	Ratio	Percentage Raising
Cashier	Rp1.650.500	Rp1.765.500	Rp115.000	0,070	6,97%
Cleaning Service	Rp1.650.500	Rp1.765.500	Rp115.000	0,070	6,97%
Staff	Rp2.740.000	Rp2.855.400	Rp115.400	0,042	4,21%
Supervisor	Rp3.250.000	Rp3.450.000	Rp200.000	0,062	6,15%
Manager	Rp4.515.000	Rp4.815.000	Rp300.000	0,066	6,64%
Warehouse	Rp2.740.000	Rp2.940.000	Rp154.400	0,056	5,64%
Security	Rp1.750.000	Rp1.940.000	Rp115.400	0,066	6,59%

Based on the salaries of Maga Swalayan employees, it can be seen that there was a salary increase in 2017-2018. This salary increase is based on the regulation of government and regional standard salary, training, profits, and benefits provided by the management to all Maga Swalayan employees. After percentage raising found there should be scoring based on weighting financial perspectives, this table presents the data:

Table 4. 11 Weighting for financial perspective using employee salary

Weight	Target	Realization	Final Score
10	7,1%	6,17%	9,45

4.2.5 Customer Perspective

The objective of this perspective is to increase satisfaction, retention, acquisition, and customer loyalty from the services provided. In this perspective, the author uses a measure of customer satisfaction. Consumer satisfaction measurements are carried out with statements relating to the level of consumer desires, the questionnaire consists of 10 statements that cover 2 criteria, namely consumer satisfaction with goods and services received by consumers of Maga Swalayan. In determining the respondents in this study, it was carried out by simple random sampling. The data in the questionnaire provided is qualitative, after all the data is collected then the data is converted into quantitative data by giving a weighting on each answer choice given by the respondent by giving the following score:

Strongly Disagree (STD) = score 1

Diasgree (D) = score 2

Less Agree (LA) = score 3

Agree (A) = score 4

Strongly Agree (SA) = score 5

This weighting has a goal to provide convenience to process data and determine the level of customer satisfaction. All questionnaires returned conditions for processing and analysis. There are 10 statements in the customer satisfaction questionnaire. The statement is like the following table 4.10 below:

Table 4. 12 Questionnaire list based on customer satisfaction

No	Statement	Indicator	STD	D	LA	A	SA
1	Strategic Maga Supermarket location	Image & Reputation					
2	The Employee appearance is good looking, clean, and professional	Image & Reputation					

3	Self-service has a comfortable atmosphere, clean floors, and fragrant rooms	Image & Reputation
4	There is a secure place to store goods	Image & Reputation
5	Employees provide services quickly and responsibly	Customer Relationship
6	The cashier gives change appropriately and well count	Customer Relationship
7	Maga Swalayan has a membership payment discount	Customer Relationship
8	Admin Social Media fast response and helpful	Customer Relationship
9	The price of goods is affordable for all community	Product Attribute
10	Allocation items are appropriate and easy to find	Product Attribute
11	Preparation of products according to the type of goods	Product Attribute
12	Products are varied and various needs	Product Attribute
13	Social Media up to date information	Information Attribute
14	Maga Swalayan has a good event during a special day	Information Attribute
15	Maga Swalayan provided well advertisement on the street	Information Attribute
16	Maga Swalayan accommodate suggestion and criticism	Information Attribute

Before conducting questionnaires, the sample counts are calculated first to find out how many samples are needed for this research. Because the proportion of the sample (p) is unknown, calculating the number of questionnaires distributed is possible:

1. Adequacy Data Test

   The formula used in conducting the adequacy data test is as follows:

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{e^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (4.2)$$

   Note:

   n = amount of data requires

   p = proportion

   Z = value of Z table connected with level of accuracy

   e = tolerance for error

a) p (proportion) calculation

$$p = \left(\frac{\textit{Number of valid sheets}}{\textit{Number of sheets distributed}}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4.3)$$

$$= \frac{70}{75}$$

$$= 0.93$$

b) Value of Z

In this study, the level of trust taken was 90%, then:

$$(1 - \alpha) = 0.90$$

$$\alpha = 0.10 = 10\%$$

$$\frac{\alpha}{2} = 5\ \% = 0.05$$

Based on table Z the value $Z_{\frac{\alpha}{2}} = 1.64$

With a maximum charging error rate (standard error) of 10%, then:

$$n = \frac{(Z_{\frac{\alpha}{2}})^2\ p(1-p)}{e^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4.4)$$

$$n = \frac{(1.64)^2 0.93(1-0.93)}{0.1^2} = 17.5$$

Based on the calculation above the value of n =17.5. Then it can be seen the minimum number of questionnaires needed is 16 items. Questionnaire data distributed were 75 items, valid data were 70 items. This shows that the data taken has fulfilled the data sufficiency requirements to represent a sample of the population.

Table 4. 13 Questionnaire results for customer satisfaction

NO	Result of Questionnaire for Customer Perspectives																
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q8	Q10	Q11	Q12	Q13	Q14	Q15	Q16	SUM
1	5	5	4	4	4	5	4	5	5	4	4	5	5	4	4	4	71
2	5	5	4	5	5	4	5	4	4	4	5	5	5	5	4	5	74
3	3	3	5	5	3	5	4	4	5	5	5	5	4	4	4	5	69
4	3	5	5	5	3	5	4	5	4	4	4	5	4	5	4	5	70
5	5	4	3	4	3	4	4	5	4	5	4	5	4	5	4	4	67
6	3	4	4	4	4	4	4	5	5	5	4	4	4	4	5	4	67
7	3	3	4	5	3	4	4	5	4	4	4	4	4	5	5	5	66
8	3	4	3	3	3	5	4	5	4	4	5	4	5	4	5	4	65
9	4	3	4	4	4	4	5	4	4	5	4	4	5	4	5	5	68
10	3	5	2	3	5	4	4	5	4	4	4	5	5	4	5	4	66
11	5	3	3	5	3	4	5	5	5	5	5	5	4	4	4	4	69
12	5	4	4	5	5	4	5	4	5	5	4	4	4	5	5	4	72
13	5	5	5	5	4	5	5	5	2	4	2	4	5	3	5	5	69
14	4	5	5	5	4	4	4	5	5	5	3	3	3	5	4	4	68
15	4	5	4	5	4	4	5	5	4	4	3	3	5	3	5	4	67
16	4	5	4	5	4	5	5	4	5	5	4	4	3	3	4	3	67
17	4	5	4	5	4	5	4	5	4	5	3	5	3	5	4	4	69
18	4	4	5	5	4	5	5	5	5	5	3	4	5	3	4	3	69
19	4	4	5	5	4	4	5	5	5	5	3	4	4	5	4	5	71
20	5	4	5	5	4	4	5	4	5	5	5	5	5	4	4	4	73
21	3	1	5	4	2	3	3	5	2	3	4	5	3	4	5	2	54
22	4	2	2	5	2	4	1	4	3	1	4	4	2	2	3	3	46
23	4	1	3	4	3	5	1	3	5	4	4	5	2	5	5	1	55
24	1	3	4	5	1	3	5	4	5	4	3	5	1	5	3	5	57
25	2	3	3	2	1	5	3	2	4	3	2	3	4	2	3	2	44
26	1	5	2	3	5	2	5	5	4	2	5	5	4	3	3	5	59
27	5	5	3	5	5	5	3	3	3	1	5	5	4	3	2	2	59
28	1	3	2	4	3	5	1	1	1	5	2	2	1	3	3	1	38
29	1	4	5	5	2	3	3	4	3	5	2	4	4	1	2	4	52
30	2	1	3	5	5	3	4	1	5	5	5	2	4	2	1	5	53
31	5	2	1	1	5	3	5	4	5	4	4	3	2	2	2	3	51
32	1	2	3	4	5	5	1	3	2	3	4	2	5	2	2	2	46
33	3	1	4	3	4	5	1	2	3	3	1	4	4	5	3	2	48

34	5	1	4	3	5	2	5	4	5	4	3	3	3	5	5	3	60
35	5	2	5	2	2	2	1	4	3	5	4	4	3	4	4	5	55
36	5	3	4	3	2	3	1	3	2	2	3	3	4	3	4	3	48
37	3	4	1	3	2	1	1	3	1	5	1	2	5	2	5	5	44
38	4	2	5	3	5	1	1	2	2	1	3	1	4	1	1	5	41
39	5	1	3	4	1	3	3	4	2	2	1	4	1	1	1	1	37
40	4	1	4	2	2	3	5	3	5	1	4	3	3	3	2	3	48
41	3	2	2	5	2	1	5	1	4	4	1	5	5	5	2	4	51
42	5	1	2	5	5	2	3	3	5	5	1	5	5	3	1	5	56
43	4	3	4	3	1	2	4	2	3	4	2	2	1	4	2	4	45
44	3	3	4	1	4	1	3	3	4	1	1	3	2	4	3	4	44
45	5	1	1	5	3	5	4	3	2	2	2	5	3	2	2	2	47
46	4	3	4	1	3	5	1	3	1	3	1	2	1	4	5	2	43
47	3	3	5	4	3	5	3	4	4	2	5	2	5	3	2	1	54
48	2	1	3	1	4	4	4	3	2	1	3	5	3	1	3	5	45
49	2	3	1	1	2	3	1	1	1	3	2	1	5	1	1	1	29
50	4	4	2	3	4	1	3	2	1	1	4	1	1	4	3	4	42
51	5	5	5	4	5	4	4	5	4	4	5	5	4	4	5	5	73
52	5	5	5	4	4	4	4	5	4	5	5	4	5	5	4	5	73
53	3	5	5	5	5	5	4	3	4	4	5	4	3	3	3	4	65
54	5	5	4	3	5	4	5	3	5	3	5	5	4	5	5	4	70
55	5	5	4	4	5	4	4	5	4	5	5	4	5	4	4	3	70
56	5	5	5	5	4	5	4	5	5	4	5	4	5	4	5	3	73
57	4	4	5	4	4	5	4	5	4	4	5	4	4	4	5	5	70
58	4	5	4	4	5	5	5	4	5	5	5	4	5	4	5	4	73
59	4	5	4	4	4	4	4	4	4	4	4	4	4	5	5	3	66
60	4	5	4	5	4	5	4	5	4	5	5	4	5	5	4	3	71
61	5	5	4	4	4	5	5	4	4	4	5	5	4	5	4	4	71
62	5	4	4	4	5	5	5	5	4	4	4	4	4	4	5	5	71
63	5	4	5	4	4	4	5	5	4	4	5	4	4	5	5	4	71
64	4	5	5	4	5	5	5	4	5	4	4	4	5	4	4	4	71
65	4	5	5	5	4	4	4	4	5	4	5	4	4	5	4	4	70
66	5	4	4	4	5	4	5	4	4	4	4	5	5	4	5	3	69
67	5	5	4	4	5	5	4	4	4	4	5	4	5	4	4	4	70
68	4	4	4	5	4	5	4	5	5	4	5	4	5	4	4	5	71
69	5	4	4	5	5	4	4	4	5	4	5	5	5	4	4	5	72
70	5	4	5	5	5	4	5	5	5	4	4	5	5	5	5	5	76

c) Validity Test

A validity test is used to determine the accuracy and precision of a measuring instrument in performing its size function and determine the variables needed are exact variables that will be generated by the researcher.

1. Hypothesis

   H_0 = Questionnaire data is valid

   H_1 = Questionnaire data is not valid

2. Significance Level

   Amount of data is 70 with degrees of freedom (df) = n-2 = 68 significance level α = 10% so obtained r_{table} = 0.1982

3. Critical Area

   If $r_{count} \geq r_{table}$ then H_0 is accepted

   If $r_{count} \leq r_{table}$ then H_0 is not accepted

Table 4. 14 Results of validity test relate to customer satisfaction statements

Statement	r_{count}	r_{table}	Status
Strategic Maga Supermarket location	0.460	0.198	Valid
The Employee appearance is good looking, clean, and professional	0.669	0.198	Valid
Self-service has a comfortable atmosphere, clean floors, and fragrant rooms	0.560	0.198	Valid
There is a secure place to store goods	0.574	0.198	Valid
Employees provide services quickly and responsibly	0,532	0.198	Valid
The cashier gives change appropriately and well count	0.475	0.198	Valid
Maga Swalayan has a membership payment discount	0.691	0.198	Valid
Admin Social Media fast response and helpful	0.744	0.198	Valid
The price of goods is affordable for all community	0.704	0.198	Valid
Allocation items are appropriate and easy to find	0.571	0.198	Valid
Preparation of products according to the type of goods	0.652	0.198	Valid
Products are varied and various needs	0.607	0.198	Valid

Social Media up to date information	0.538	0.198	Valid
Maga Swalayan has good event during the special day	0.645	0.198	Valid
Maga Swalayan provided well advertisement on the street	0.663	0.198	Valid
Maga Swalayan accommodate suggestion and criticism	0.500	0.198	Valid

d) Reliability test

A reliability test is a level that measures the reliability of results if repeated measurements are made on a characteristic. Reliability testing is calculated using *Cronbach's Alpha* value.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.881	.881	16

Figure 4. 2 Reliability Statistics relate to customer satisfaction

1. Hypothesis

   H_0 : reliable question questionnaire data

   H_1 : questionnaire question data is not reliable

2. Critical area

   If $r_{count} \geq r_{table}$ then H_0 is accepted

   If $r_{count} \leq r_{table}$ then H_0 is not accepted

e) Decision

Questionnaire data is said to be reliable if the r_{alpha} value is greater than 0.6. R_{alpha} value is obtained from data processing using software and produces Cronbach's Alpha value = 0.881. Then the questionnaire data is declared reliable or H_0 is accepted because the Cronbach's Alpha value is greater than r_{count} which is equal to 0.6.

f) Satisfaction Interval

While determining customer satisfaction scores on performance and service at Maga Swalayan, the author calculates the satisfaction interval, and the results are shown below:

IK_{max} = PP x R x EX_{max}
= 16 x 70 x 5
= 5600

IK_{max} = PP x R x EX_{max}
= 16 x 70 x 1
= 1120

Interval = (5600 – 1120) : 5
= 896

After the satisfaction interval is found, then the results of customer satisfaction are categorized as follows**:**

Table 4. 15 Customer satisfaction category

896	1792	Very dissatisfied
1792	2688	Dissatisfied
2688	3584	Satisfied enough
3584	4480	Satisfied
4480	5376	Very satisfied

By looking at the sum of the results of the customer satisfaction questionnaire by 4244, the results of customer satisfaction are categorized as very satisfied. The next step is weighing customer satisfaction and calculating the score achieved by the performance of Maga Swalayan, these results are shown as follows:

Table 4.16 Weighting of customer satisfaction

Weight	Target	Realization	Score	Final Score
25	100%	78,94%	78,94	19,73

From the table above it can be seen that the perspective of customer satisfaction has a realization value of 78,94% of the target to be achieved that is 100% with a weight of 25. So, the final score of 78,94 and a final score of customer satisfaction is 19,73 it means there should be another improvement to maximize employee performance at Maga Swalayan.

4.2.6 Internal Business Process Perspective

The aim of this perspective is to improve the business process of operations within the company. In this perspective, the author uses the employee performance index in the operation process, counts the number of defective products in the warehouse, and the use social media for marketing and delivery of information. The indicators used in measuring employee performance are understanding of main objective and function, speed of work, the accuracy of work, and cooperation. Employee performance measurements are carried out with statements relating to the level of employee performance, the questionnaire consists of 10 statements that cover the performance and abilities of employees of Maga Swalayan.

To count the number of defective products in the warehouse, the Author conduct interviews with the head of the production department related to defective products that have been counted since the previous period, then calculate the percentage of defective products in the previous period.

A. Employee Performance Index

In determining respondents in this study, it was done by simple random sampling. The data in the questionnaire given is qualitative, after all the data collected then the data is converted into quantitative data by giving a weighting to each choice of answers given by respondents by giving a score as follows:

Strongly Disagree (STD) = score 1

Disagree (D) = score 2

Less Agree (LA) = score 3

Agree (A) = score 4

Strongly Agree (SA) = score 5

The scoring aims to make it easy to process data and determine the level of customer satisfaction. All returned questionnaires are required to be processed and analyzed. There are 16 statements in the customer satisfaction questionnaire. As for the statements like the following table:

Table 4. 17 Questionnaire results for employee index performance

NO	QUESTIONNAIRE RESULTS FOR EMPLOYEE INDEX PERFORMANCE															
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
1	5	5	5	4	5	5	5	5	5	4	4	4	5	5	5	4
2	4	5	4	5	4	5	5	5	5	5	5	5	4	5	5	5
3	5	5	4	4	4	5	4	4	4	5	5	4	5	5	4	4
4	4	5	5	4	4	5	5	5	4	4	4	4	4	5	5	5
5	5	5	4	5	5	4	5	4	4	4	4	4	5	5	5	4
6	4	5	5	4	4	5	4	5	5	5	4	4	5	5	5	4
7	5	4	4	4	4	4	4	5	5	4	4	5	5	4	4	5
8	5	5	4	4	5	5	4	5	5	4	5	4	5	4	5	4
9	4	5	4	5	4	4	4	4	4	4	5	4	5	5	5	4
10	4	5	4	5	5	5	5	5	4	5	4	5	5	5	5	5
11	5	5	4	4	5	5	5	4	4	5	5	5	4	5	4	5
12	5	5	4	4	5	5	5	5	5	4	5	4	5	4	4	5
13	5	5	4	4	4	5	4	4	5	5	5	5	5	4	5	5
14	5	5	5	4	5	4	4	5	5	4	4	4	5	5	4	5
15	5	5	5	4	4	5	4	4	5	5	5	4	4	5	4	5
16	5	5	5	5	4	5	5	4	4	5	4	5	4	4	4	5
17	5	4	5	4	5	4	4	5	4	5	4	4	5	5	4	5
18	2	2	2	2	4	4	3	3	3	4	4	4	2	3	3	4
19	4	4	3	3	4	3	2	3	4	2	4	4	3	2	4	3
20	4	4	2	4	4	2	2	4	4	3	4	4	3	2	3	3
21	2	3	4	2	4	2	3	4	3	4	2	2	2	3	2	4
22	3	2	2	3	3	4	3	2	2	3	3	3	3	3	3	3
23	4	2	2	3	2	3	4	4	4	3	4	2	2	3	4	3
24	4	4	4	2	4	3	2	4	4	2	3	3	4	4	3	3
25	4	4	4	4	4	3	4	2	3	4	4	4	4	4	4	2

26	4	3	4	3	2	3	3	3	2	2	2	4	2	4	4	4
27	2	4	4	3	4	4	2	3	4	2	4	4	4	3	3	4
28	4	5	4	5	5	5	4	4	5	4	5	5	4	5	4	5
29	5	4	4	4	5	4	5	4	4	4	4	4	5	4	5	4
30	5	4	5	5	4	5	4	5	4	4	4	5	5	5	4	5
31	5	4	4	5	5	4	5	5	5	5	4	5	5	5	5	4
32	5	5	5	5	5	4	4	4	4	5	5	4	4	4	4	5
33	5	5	4	4	5	5	4	4	5	5	5	4	5	4	5	4
34	5	5	4	5	4	5	4	4	5	5	4	5	5	5	5	4
35	5	4	4	5	4	4	4	5	5	5	5	4	5	4	5	4
36	4	5	4	4	5	4	5	4	4	4	5	4	5	4	5	5
37	4	4	5	5	4	5	4	5	5	5	4	5	5	4	4	4
38	4	5	5	4	5	5	5	4	5	4	5	4	4	5	5	5
39	5	5	5	4	5	4	5	5	5	5	5	4	4	5	4	5
40	5	4	4	4	5	4	4	5	5	5	5	4	5	4	4	4
41	3	4	4	5	4	3	3	5	4	4	4	4	4	4	3	3
42	3	4	4	4	3	5	4	3	3	5	5	4	4	3	4	3
43	3	5	5	5	4	5	4	5	4	3	5	3	5	4	4	3
44	5	5	3	3	5	4	3	3	3	3	4	5	4	5	5	5
45	4	4	3	4	4	4	5	5	5	4	3	5	4	4	5	5
46	3	3	5	5	5	3	4	4	3	5	3	3	5	4	5	4
47	4	4	4	3	3	4	5	3	4	5	4	3	4	4	5	5
48	5	5	3	4	3	5	4	4	3	5	4	3	3	5	5	4
49	5	4	4	5	4	3	3	5	5	4	3	3	5	5	5	5
50	3	4	5	4	4	5	4	4	3	5	3	4	4	4	4	3
51	5	3	4	4	4	4	3	3	3	5	3	5	4	3	5	3
52	4	4	5	3	4	3	3	3	4	3	5	5	4	3	4	5
53	5	4	4	4	5	4	4	5	5	5	5	5	4	5	4	5
54	4	5	4	4	4	5	4	5	4	4	4	4	5	5	4	5
55	5	5	5	5	5	4	5	5	5	5	5	5	5	4	5	4
56	4	5	5	4	5	5	4	5	4	4	5	5	5	4	4	5
57	5	5	5	4	4	4	5	4	4	5	5	5	5	4	5	5
58	5	4	5	5	4	5	4	4	5	5	5	5	5	4	4	5
59	5	4	5	5	4	5	4	4	4	4	5	4	5	5	5	4
60	5	5	4	4	5	5	5	5	5	4	4	5	5	5	5	4
61	5	5	5	5	4	5	5	4	5	5	4	4	5	4	5	5
62	5	4	4	4	5	4	4	4	5	4	5	4	4	5	5	4
63	4	4	4	4	4	4	5	5	5	4	4	4	4	4	4	5
64	4	4	4	4	5	5	4	5	4	4	4	5	4	5	4	5
65	5	5	4	4	5	5	5	4	5	4	5	4	4	5	4	5
66	5	5	4	4	4	4	4	5	5	4	5	4	5	4	4	4
67	4	5	5	4	4	4	3	5	3	4	4	3	3	4	4	3
68	3	3	5	3	3	3	5	4	4	5	3	5	3	3	5	5
69	5	4	3	4	5	3	5	5	4	5	4	4	4	5	5	4

70	4	4	5	5	3	5	5	4	3	5	5	4	5	3	5	4
71	5	4	4	4	5	3	3	4	3	3	3	3	3	4	5	5
72	4	5	4	4	5	4	4	4	3	4	3	4	3	5	4	3
73	5	4	3	3	5	4	5	4	3	3	3	3	5	5	3	4
74	5	5	4	5	4	5	3	5	3	4	5	5	5	3	3	5
75	3	3	4	5	4	4	4	4	3	4	3	5	3	4	5	4

Based on the data collected, the next process is deciding the statement accordingly with an indicator that has already been made to calculate the employee's performance index correctly. There are 4 indicators related to the employee performance index, first one is reliability an indicator to measure employee is reliable (can be trusted) to do work correctly. The second one is satisfaction for an employee to do work in his/her workplace. The third one, effectivity is an indicator to measure employee accuracy and effectiveness in completing the task, examination, and evaluation while they are working. There are 16 statements related to these indicators that should be filled with the employee of Maga Swalayan. From the results of this questionnaire, it can be known the influence of indicators on employee performance index in weighting and calculation of the final score. The statement and indicator can be seen in Table 4.12 below:

Table 4. 18 Employee performance index statement list

No	**Employees Performance Index**						
	Statement	Indicator	STD	D	LA	A	SA
1	Understand the assignment according to employee job	Reliability					
2	The employee has a good commitment to superior	Reliability					
3	Support teamwork to finish the job on time	Reliability					
4	Initiative to ask for additional work with superior	Reliability					
5	There is a guarantee for occupational health and safety	Satisfaction					
6	A compliment from a superior help employee to work harder	Satisfaction					
7	Superior always give appraisal with good performance	Satisfaction					
8	The company supports meals allowance and overtime pay	Satisfaction					
9	The facility in Maga Swalayan helps the employee to finish the work	Effectivity					
10	Always submit the assignment on time	Effectivity					

11	There is a to-do list for an employee before starting to work	Effectivity
12	When working don't waste resources in vain	Effectivity
13	Employees wear uniforms in daily work	Tangible
14	Workplace clean and comfortable for work	Tangible
15	Internet support for internal staff at Maga Swalayan	Tangible
16	Maga Swalayan provided computer for internal staff	Tangible

Before distributing the questionnaire, the adequacy data test should be conducted to find out minimum sample is needed. Using the Slovin formula and a 95% confidence level, the following results are obtained:

a. Adequacy Data Test

$$n = \frac{N}{1 + (N \times e^2)} \quad \text{..... (4.5)}$$

Sumber: Kadir, 2015

$$n = \frac{75}{1 + (75 \times 0.05^2)}$$

$$n = 63.1$$

Which :

n = sample

N = Total Population

e = limit of error tolerance

Slovin test calculations use a probability level of 0.05 with a 95% confidence level, based on the results of these calculations the value of n is 63.1. so, the minimum sample is 63 to fulfill the requirement. When distributing questionnaires, the number of questionnaires filled was 75 which means corresponds to the number of employees working at Maga Swalayan. After that, this test should be valid so this questionnaire will be taken to validity test and reliability test.

b. Validity Test

A validity test is used to determine the accuracy and precision of a measuring instrument in performing its size function and determine the variables needed are exact variables that will be generated by the researcher.

1. Hypothesis

   $H_0 =$ Questionnaire data is valid

   $H_1 =$ Questionnaire data is not valid

2. Significance Level

   Amount of data is 75 with degrees of freedom (df) = n-2 = 73 significance level α = 10% so obtained $r_{table} = 0.2272$

3. Critical Area

   If $r_{count} \geq r_{table}$ then H_0 is accepted

   If $r_{count} \leq r_{table}$ then H_0 is not accepted

After that checking the validity test for employee index performance if there is an unmatched questionnaire then the statement must be discarded

Table 4. 19 Validity test results relate to employee index performance

Questionnaire	r_{count}	r_{table}	Status
Understand the assignment according to employee job	0.640	0.2272	Valid
The employee has a good commitment to superior	0.730	0.2272	Valid
Support teamwork to finish the job on time	0.559	0.2272	Valid
Initiative to ask for additional work with superior	0.665	0.2272	Valid
There is a guarantee for occupational health and safety	0.532	0.2272	Valid

A compliment from a superior help employee to work harder	0.661	0.2272	Valid
Superiors always give appraisals with good performance	0.672	0.2272	Valid
Company support meals allowance and overtime pay	0.608	0.2272	Valid
The facility in Maga Swalayan helps an employee to finish the work	0.679	0.2272	Valid
Always submit the assignment on time	0.620	0.2272	Valid
There is a to-do list for the employee before starting the work	0.601	0.2272	Valid
When working, the employee does not waste resources in vain	0.526	0.2272	Valid
Employees wear uniforms in daily work	0.760	0.2272	Valid
Workplace clean and comfortable for work	0.645	0.2272	Valid
Internet support for internal staff at Maga Swalayan	0.554	0.2272	Valid
Maga Swalayan provided computer for internal staff	0.569	0.2272	Valid

c. Reliability Test

A reliability test is a level that measures the reliability of results if repeated measurements are made on a characteristic. Reliability testing is calculated using *Cronbach's Alpha* value.

1. Hypothesis

   H_0 : reliable question questionnaire data

   H_1 : questionnaire question data is not reliable

2. Critical area

If $r_{count} \geq r_{table}$ then H_0 is accepted

If $r_{count} \leq r_{table}$ then H_0 is not accepted

3. Decision

Questionnaire data is said to be reliable if the r_{alpha} value is greater than 0.6. R_{alpha} value is obtained from data processing using software and produces Cronbach's Alpha value = 0.898 with N of items 16. Then the questionnaire data is declared reliable or H_0 is accepted because the Cronbach's Alpha value is greater than r_{count} which is equal to 0.6.

d. Satisfaction Interval

IK_{max} = PP x R x EX_{max}
= 16 x 75 x 5
= 6000

IK_{max} = PP x R x EX_{max}
= 16 x 75 x 1
= 1200

Interval = (6000 – 1200) : 5
= 960

After the satisfaction interval is found, then the results of customer satisfaction are categorized as follows:

Table 4. 20 Employee Performance Index Satisfaction Interval

1200	2160	Very bad
2160	3120	Bad
3120	4080	Enough
4080	5040	Good
5040	6000	Very Good

By looking at the sum of the results of the employee index performance questionnaire by 5054, the results of employee index performance are categorized as good. The next step is weighting employee index performance and calculating the score achieved by the performance of Maga Swalayan, these results are shown as follows:

Table 4. 21 employee performance index weighting score

Weight	Target	Realization	Score	Final Score
15	100%	84,2%	84,2	12,63

From the table above it can be seen that the perspective of customer satisfaction has a realization value of 84,2% of the target to be achieved which is 100% with a weight of 15. So, the final score of 84,2 and a final score of customer satisfaction is 12,63 it means good as an index performance but there are some points to achieve the target of 100% and Maga Swalayan needs some improvements related to the results.

B. Defective Product in warehouse

Count the number of defective products in the warehouse needed to be comparable to all products in the warehouse during a certain period. Defective products in warehouses can be calculated using the formula:

$$\text{Defective product in warehouse} = \frac{\text{Defective Product}}{\text{Total Product in warehouse}} \times 100\%$$

$$\text{Defective product in warehouse 2017} = \frac{648}{110480} \times 100\%$$

$$= 0.58\%$$

$$\text{Defective product in warehouse 2018} = \frac{867}{121942} \times 100\%$$

$$= 0.71\%$$

Table 4. 22 Weighting result relate to defective product in warehouse

Year	Weighting	Target	Realization	Final Score
2017	10	0,5%	0,58%	8,62
2018	10	0,5%	0,71%	7.04

Based on calculations of defective products in the warehouse it was found that in 2017 the realization is 0,58% while the target is 0,5% and in 2018 the defected product in warehouse percentage increased 0,71% while the target expected by Maga Swalayan was 0,5% then the final result obtained was 7,04 for 2018 and 8,62 for 2017 it means the defect will cause loss for Maga and sales growth will affect cause of this, based on this result the realization in Maga Swalayan still exceed the target of the company it means there is product waste in the inventory of Maga Swalayan and management should take an action to minimize and maintain the warehouse for next period.

4.2.7 Learning and Growth Perspective

The objective of this perspective is to increase employee satisfaction, performance, and loyalty from employees to the company. In this perspective, the authors use measures of employee satisfaction and employee retention to find out the satisfaction for all employees and the resistance for all employees in order to work on a long-term scale.

A. Employee Index Satisfaction

Employee satisfaction measurements were carried out with a questionnaire containing statements relating to the level of employee satisfaction. The questionnaire consisted of 10 statements covering 2 criteria, namely employee satisfaction for appreciation received by employees from Maga Swalayan. In determining the respondents in this study, it was carried out by simple random sampling.

The data in the questionnaire given is qualitative, after all the data is collected then the data is converted into quantitative data by giving weight to each of the answer choices given by respondents by giving the following scores:

Strongly Disagree (STD) = score 1

Disagree (D) = score 2

Less Agree (LA) = score 3

Agree (A) = score 4

Strongly Agree (SA) = score 5

Scoring aims to provide convenience to process data and determine the level of customer satisfaction. All questionnaires returned conditions for processing and analysis. There are 16 statements in the customer satisfaction questionnaire. The statement is like the following table:

Table 4. 23 Questionnaire list based on employee satisfaction

No	Statement	STD	D	LA	A	SA
1	Employee happy with their job description					
2	Employees feel monthly income is enough					
3	Employees feel workload is fair					
4	Employee comfort with the workplace					
5	The employee commits long term work					
6	Communication between teamwork positive					
7	Communication between superior and employee good and clear					
8	Superior punishment is acceptable and fair					
9	Superior treats all of the employees fair and honest					
10	The employee has freedom of speech to share the aspiration					
11	There is no harassment between women and men in the workplace					

12	The level of work in the company is open to all employees
13	Annual salary increases are sufficient
14	Bonus for a special day such as Idul Fitr is sufficient
15	Working hour is fair and always on time
16	There is no difference between men and women in the workplace

Before distributing the questionnaire, the adequacy data test should be conducted to find out minimum sample is needed. Using the Slovin formula and a 95% confidence level, the following results are obtained:

a. Adequacy Data Test

$$n = \frac{N}{1 + (N \times e^2)} \ldots\ldots\ldots\ldots\ldots\ldots (4.6)$$

Sumber: Kadir, 2015

$$n = \frac{75}{1 + (75 \times 0.05^2)}$$

$$n = 63.1$$

Which :

n = sample

N = Total Population

e = limit of error tolerance

Slovin test calculations use a probability level of 0.05 with a 95% confidence level, based on the results of these calculations the value of n is 63.1. so, the minimum sample is 63 to fulfill the requirement. When distributing questionnaires, the number of questionnaires filled was 75 which means corresponds to the number of employees working at Maga Swalayan.

b. Validity Test

A validity test is used to determine the accuracy and precision of a measuring instrument in performing its size function and determine the variables needed are exact variables that will be generated by the researcher.

1. Hypothesis

$H_0 =$ Questionnaire data is valid

$H_1 =$ Questionnaire data is not valid

2. Significance Level

Amount of data is 75 with degrees of freedom (df) = n-2 = 73 significance level α = 10% so obtained $r_{table} = 0.2272$

3. Critical Area

If $r_{count} \geq r_{table}$ then H_0 is accepted

If $r_{count} \leq r_{table}$ then H_0 is not accepted

Table 4. 24 Validity test result for employee satisfaction

Questionnaire	r_{count}	r_{table}	Status
Employee happy with their job description	0.418	0.2272	Valid
Employees feel monthly income is enough	0.514	0.2272	Valid
Employees feel workload is fair	0.419	0.2272	Valid
Employee comfort with the workplace	0.310	0.2272	Valid
Employees commit long term work	0.586	0.2272	Valid
Communication between teamwork positive	0.334	0.2272	Valid
Communication between superior and employee good and clear	0.515	0.2272	Valid
Superior punishment is acceptable and fair	0.361	0.2272	Valid
Superior treats all of the employees fair and honest	0.375	0.2272	Valid

The employee has freedom of speech to share the aspiration	0.310	0.2272	Valid
There is no harassment between women and men in the workplace	0.451	0.2272	Valid
The level of work in the company is open to all employee's	0.397	0.2272	Valid
Annual salary increases are sufficient	0.533	0.2272	Valid
Bonus for a special day such as Idul fitr is sufficient	0.375	0.2272	Valid
Working hour is fair and always on time	0.572	0.2272	Valid
There is no different treatment from superior for men and women in the workplace	0.475	0.2272	Valid

e. Reliability Test

A reliability test is a level that measures the reliability of results if repeated measurements are made on a characteristic. Reliability testing is calculated using *Cronbach's Alpha* value.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.717	.713	16

Figure 4.2 Reliability Test results for Satisfaction Employees

1. Hypothesis

   H_0 : reliable question questionnaire data

   H_1 : questionnaire question data is not reliable

2. Critical area

   If $r_{count} \geq r_{table}$ then H_0 is accepted

   If $r_{count} \leq r_{table}$ then H_0 is not accepted

3. Decision

   Questionnaire data is said to be reliable if the r_{alpha} value is greater than 0.6. R_{alpha} value is obtained from data processing using software and produces Cronbach's Alpha value = 0.639. Then the questionnaire data is declared reliable or H_0 is accepted because the Cronbach's Alpha value is greater than r_{count} which is equal to 0.6.

f. Satisfaction Interval

IK_{max} = PP x R x EX_{max}
= 16 x 75 x 5
= 6000
IK_{min} = PP x R x EX_{min}
= 16 x 75 x 1
= 1200

Interval = (6000 – 1200) : 5
= 960

After the satisfaction interval is found, then the results of customer satisfaction are categorized as follows**:**

Table 4. 25 Employee satisfaction index category

1200	2160	Very bad
2160	3120	Bad
3120	4080	Enough
4080	5040	Good
5040	6000	Very Good

By looking at the sum of the results of the employee index performance questionnaire by 5271, the results of employee index performance are categorized as very

satisfied. The next step is weighting employee index performance and calculating the score achieved by the performance of Maga Swalayan, these results are shown as follows:

Table 4. 26 Weighting of employee satisfaction index

Weight	Target	Realization	Score	Final Score
20	100%	87,85%	87,85	17,57

From the table above it can be seen that the perspective of customer satisfaction has a realization value of 87.85% of the target to be achieved that is 100% with a weight of 20. So, the final score of 87.85% and a final score of customer satisfaction is 17.57 it means there should be another improvement to satisfying employees at Maga Swalayan.

B. Employee Retention

A stage that shows the company's capability to maintain employee retention in it. It can be done when the company is able to control employees and minimize employee turnover by providing the employees with comfortable facilities and services. To see the extent of employee loyalty to the company formulated by calculation:

$$\text{Employee Retention} = \frac{\text{Amount of employee left}}{\text{Total employee}} \times 100\%$$

Table 4. 27 Employee left period 2017 - 2018

Year	**Total Left Employee**	**Total Employee**
2017	5	75
2018	6	75

So that:

$$\text{Employee Retention}_{2017} = \frac{5}{75} \times 100\% = 6.67\%$$

$$\text{Employee Retention}_{2018} = \frac{6}{75} \times 100\% = 8\%$$

Table 4. 28 Employee retention level

Year	Weight	Target	Realization	Final Score
2017	5	<10%	6,67%	5
2018	5	<10%	7,3%	5

Based on the results above table the percentage of retention rates employees in 2017 is less than 10%, realization 6,67% is a good achievement because the employee loyal with the company so there is no shortage. But in 2018 the realization increases to 7,3% with the same target <10%. It means Maga Swayalan in 2018 has an issue regarding employee satisfaction it will affect learning and growth perspectives result. Overall, the final score is 5 it means Maga has already achieved the target and needs to keep the performance for the next period.

4.2.8 Weighting Balanced Scorecard

The amount of weight is determined based on the importance of the outcome measure towards the company's goals. Currently, Maga Swalayan is focusing their effort on improving the whole perspective, therefore all measures that are seen by companies are important to achieve better results for the company going forward. Weighting for each perspective is in Table 4.24 below:

Table 4. 29 Balanced scorecard Comparison Result

No	Perspective	Measures	Target	2017	2018	Growth	Status
1	Financial	Sales Growth	12%	6,37%	5,73%	-0,64	Not Achieve
		Employee Salary	7,10%	-	6,17%	+6,17	Not Achieve
2	Customer	customer satisfaction	100%	-	78,94%	+78,94%	Not Achieve

3	Internal Business Process	employee performance	100%	-	84,20%	+84,20%	Not Achieve
		Defect Product	0,50%	0,58%	0,71%	+0,13%	Not Achieve
4	Learning and Growth	employee satisfaction	100%	-	87,85%	+87,85%	Not Achieve
		Retention Employee	10%	6,67%	7,30%	+0,63%	Still Achieve

Based on the table above there is a comparison between achievements in 2017 and 2018, from 4 perspectives, measurement of learning and growth with employee retention measures being the only measurement whose target Maga has achieved in 2 consecutive years. However, overall Maga Swalayan still needs to improve its performance towards customers, internal business processes, and finance.

Table 4. 30 Balanced Scorecard scoring result

No.	**Perspectives**	**Measures**	**Weight**	**Target**	**Realization**	**Final Score**	**Status**
1	Financial	Sales Growth	15	12%	5,73%	7,16	Need Improvement
		Employee Salary	10	7,10%	6,17%	9,45	Need Improvement
2	Customer	Index of customer satisfaction	25	100%	78,94%	19,73	Need Improvement
3	Internal Business Process	Index of employee performance	15	100%	84,20%	12,63	Need Improvement
		Defect Product	10	0,50%	0,46%	7,04	Need Improvement

4	Learning and Growth	Index of employee satisfaction	20	100%	87,85%	17,57	Need Improvement
		Retention Employee	5	10%	7,30%	2.09	Achieve
Total			100	47%	39%	73,58	Mostly Need Improvement

Based on the data above, there is a gap between the targets to the realization on the floor, to facilitate management in improvisation of the coming period can be seen from the largest gap. The status 'need improvement' means the company should be aware to take any actions for the next period and 'achieve' means the company should maintain performance stability. These results will lead us to discuss the right action so that Maga Swalayan get improvements in the future and know the problem solving for each perspective. Overall performance of a company can be measured using interval value from 1% - 100%. Based on the value there will be divided into 5 categories which are explained as follows:

a. If the score of intervals is between 1% - 20% it means performance is very bad.
b. If the score of intervals is between 21% - 40% it means performance is bad.
c. If the score of intervals is between 41% - 60% it means performance is enough.
d. If the score of intervals is between 61% - 80% it means performance is good.
e. If the score of intervals between 81% - 100% it means performance is very good.

Based on the result of the 4 perspectives in Table 4.25 the final score is 73,58% it means Maga Swalayan achieved good performance, but the average gap of realization is 8,42% it means there is space for improvement in the future and the company able to focus on the highest gap. If sorted from the highest gap, it can be seen in Table 4.26 below:

Table 4. 31 Perspective Gap percentage

Perspectives	**Gap**

Customer	21,06%
Internal Business Process	15,84%
Learning and Growth	14,85%
Financial	7,20%

Customer perspective has the highest gap of 21,06% among the other and there should be an action to improve this and the lowest is financial perspectives with a 7,20% gap.

4.3 Industry 4.0 Concept of Transparency

Based on the results of the interview on the application of the 4 pillars of industry 4.0 in this study using one of the pillars, called transparency, with the purpose of knowing whether the company has delivered information related to inventory accessibility, flexibility product delivery, accuracy order, and comprehensive of transparency for inventory management. The transparency lead company into clear and safe transactions between suppliers, Maga Swalayan, and customers. The concept of transparency is shown based on figure 4.3 below.

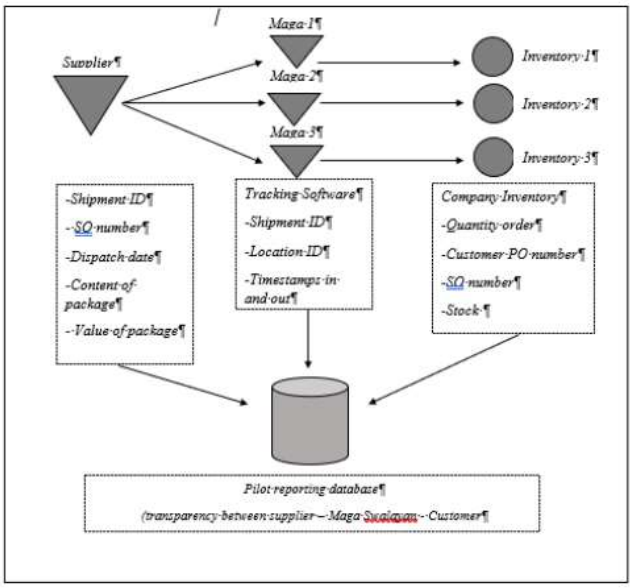


Figure 4. 3 The concept of transparency

The shipment should be trackable to make it easy for the supplier and Maga Swalayan to find the location and estimate the destination time. the representatives of the installation companies were assigned to hand out the products and instruct personnel in each of the storages to maintain the products. Based on the concept above there is checklist transparency that has been taken through interviews from the warehouse in charge and the manager, the questionnaire is shown below in Table 4.23:

Table 4. 32 Checklist table of implementation transparency at Maga Swalayan

Dimension	Variable	Maga Swalayan Response
Accessibility	Easiness access information for the supplier to Maga Swalayan	3
	Near field communication using the device	1
	Tracking delivery with GPS	2
Flexible	Maga Swalayan able to move products from 1 store to another branch	5
	Automatically update status delivery to suppliers	3
	Update the quantity with internet access	4
Accuracy	Use real-time and data-driven information to enable decision making	3
	Calculation with Excel or additional Softwares	3
	Order quantity and Inventory capacity never exceed	5
Comprehension	Employee able to access Microsoft	4
	Managers understand the goal of transparency	5
	Maga Swalayan notice the capacity of inventory	5

	Communicative between employee and superior in warehouse	3

Based on the checklist above there are 10 questions related to transparency measurement in Maga Swalayan, the data were taken by interviewing 2 experts in Maga and the answer will lead this research to the importance of transparency measurement in Maga Swalayan. The next step is calculating the readiness index (I_D) for each company dimension. The dimensional readiness index is the average value of the variable readiness index (V_{Di}) in that dimension or can be written in the formula:

$$I_{\mathrm{D}} = \frac{\sum_{i=1}^{n} V_{\mathrm{Di}}}{n} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4.7)$$

Which are:

I_{D} : Dimensional Readiness Index

V_{Di} : The value of I variable in the dimension

n : Amount of variable in Dimension

The result of the readiness transparency measurement must be able to assist companies in following 4.0 industry trend by providing recommendations to increase knowledge about industry 4.0 and the ability to implement industry 4.0. To make it easier for companies to understand their readiness for transparency, the results of measuring aspects of industrial readiness are grouped into the "knowledge" aspect K_{P} and the "resource capability" aspect K_{K} is described in the form of a quadrant matrix. For each aspect K_{P} and K_{K} calculated from the average dimensional index in the related aspects, using the formula:

$$K_{\mathrm{P}} = \frac{I_{\mathrm{D(A)}} + I_{\mathrm{D(F)}}}{2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4.8)$$

$$K_{\mathrm{K}} = \frac{I_{\mathrm{D(ACC)}} + I_{\mathrm{D(C)}}}{2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4.9)$$

Which are:

K_{P} : Index readiness knowledge aspect

K_{K} : Index readiness resource capability

$I_{\mathrm{D(A)}}$: Index readiness dimension accessibility

$I_{D(F)}$: Index readiness dimension Flexibility

$I_{D(ACC)}$: Index readiness Accuracy

$I_{D(C)}$: Index readiness Comprehensive

Companies that have low K_P values and low K_K values are in quadrant 1, level "not ready" which means the company does not have sufficient requirements and knowledge to start the industry 4.0 trends. Companies that have a high K_P values and low K_K are in quadrant 2, the level at "conditionally ready", which means the company already has sufficient knowledge regarding industry 4.0 but does not have the resource capabilities needed to start the industry 4.0 transformation process. Companies that are in quadrant 2 need low direction but need high support to improve their resource capabilities so the implementation can immediately start.

Companies that are in quadrant 3, the "basic readiness" level are companies that have low K_P values and high K_K values. This company already has the capabilities of the resources to start the readiness but it needs further education and training for resources to understand the way of implementation transparency in the company since basically the ability is already existed to applicate the values of transparency.

CHAPTER V

RESULT AND DISCUSSION

5.1 Analysis of Balanced Scorecard Perspective

After data collection is complete, in this chapter the author will describe the results of the data collected and discuss the causes and effects of each result obtained from data collection. This discussion is also described based on the results of interviews and the author's understanding of the phenomena that occur at the research location.

5.1.1 Financial Perspective Result

This result uses sales growth and employee salary growth per year to analyze the performance of Maga Swalayan from a financial perspective. This measurement will be used for deciding the score of financial in Maga Swalayan, based on Table 5.1 Sales growth and Employee's salary growth measurement is illustrated as below:

Table 5. 1 Sales growth and Employee's growth

Year	Weight	Target	Realization	Final Score
2017	**15**	12%	6,37%	7,96
2018	**15**	12%	5,73%	7,16

Based on the target for sales growth is 12% but the realization from Maga Swalayan since in 2017 still 6,37% and during 2018 the realization is 5,73% it means there is a gap

6,27% in this year. It happened because the Maga Swalayan expanding to the second floor to build a boutique and requires a separate fee for expanding, and customers mostly come on weekends so daily earnings was relatively smaller from Monday to Friday. For the employee's salary growth, the target is 7,1% and realization already hit 6,17%, it is a good achievement because the score is 8,6 the government regulation driving management to maintain the salary appropriately and fair. This salary increases also happened because the sales in 2018 improve rather than last year so all of the employees get the benefit from the good performance for 1-year performance, but still, the target should be achieved for the next period or the target can be modified according to ability and capacity of Maga Swalayan. Based on this data total final score is 15,76 when the weighted total is 25 and the target is 19,1% it needs improvement to gain more profit based on selling.

5.1.2 Customer Perspective Result

The customer perspective in Maga Swalayan focused on the satisfaction of all customers that buy and use the facility in the store. The result from 70 questionnaires given to customers for 3 days of observation, after the questionnaire is submitted the data will be used for validation and reliability tests so that the data used is valid and reliable. Data declared reliable if r_{count} more than r_{table} . In this reliability test, Cronbach Alpha's found is 0,881 more than 0,6 it means H_1 acceptable and questionnaires are reliable. Based on the score interval between 896 – 5376, it is shown that the satisfaction value is 4244 it means the satisfaction level is good and customers are happy with the services and facilities provided by the department store. Based on the weighting with 25 values and target 100% satisfaction, Maga achieve 78,94% with a final score of 19,73.

Table 5. 2 Customer satisfaction final score

Weight	Target	Realization	Score	Final Score
25	100%	78,94%	78,94	19,73

This result has the highest gap among the others, it has a 21,06% gap between realization and target from management. It happened because the preparation of products is not proper enough so the customer needs to look around, Maga should Maga can provide signs that hang according to the product category to make it easier for customers

to find the products they need. The last one Maga Swalayan should advertise more intensely for the products and maintain media social for delivering information relate to promotion and events to get attention from customers.

5.1.3 Internal Business Process Perspective Result

There are 2 measurements used for this perspective, the first one is the employee performance index to measure the performance of 75 employees with different background studies and departments at Maga Swalayan. The last one is measuring defective products in the warehouse and making a comparison between the recent period with the previous one.

5.1.3.1 Employee Performance Index result

The employee performance index was built with 4 indicators those are reliability, satisfaction, effectivity, and tangible. From this indicator, there are 16 statements support for each and the questionnaire should be filled with 75 employees at Maga Swalayan. There is a 5 scale from strongly disagree until strongly agree. This questionnaire should be valid and reliable as well so to fulfill this requirement, the author conduct a validity test and reliability test using SPSS, after all the questions were valid because if r_{count} more than r_{table}. In reliability the value of Cronbach's Alpha value is 0,898 it is greater than 0,6 it means the H_1 acceptable and questionnaires are reliable.

Based on the cumulative score for employee index performance the score is 5054 with interval score 1200 – 6000 it categorizes as good performance. However, based on the target set by the company regarding employee performance, a gap of 15,80% was found, of which the company's target was 100% but the realization was still 84,20%.

Table 5. 3 Employee performance index final score

Weighting	Target	Realization	Final Score
15	100%	84,2%	12,63

The result for the employee performance index is 12,63 it means the performance still needs more attention from management so there is improvement in the future and all of the employees are aware of their performance and to achieve improvement, management should evaluate periodically to monitor the progress and maintain the development. The employee should have the initiative to ask for additional work with superior in order to achieve company goals and target, so the superior can give a good rating to the employee, when employee achieve the goals and target from the company, superior must appraise and motivate employees because the achievement related to vision and mission, and because the facilities provided related to comfort and access still need improvement in the future, management should aware to improve the speed of internet connection to avoid delay information, management should aware about inventory cleanness in order to improve pace of work.

5.1.3.2 Defective product in warehouse result

In determining the internal business condition of the supermarket, the condition of the self-service warehouse is one of the observation media because access to information on the condition and situation of the warehouse is easy to obtain and reliable to be used as a measurement. In 2017 the defective product in the warehouse is 0,58% it is greater than the target of the company 0,5% unfortunately in 2018 the defective product in the warehouse is 0,71% greater than the target and last period, Table 5.4 shows the result of weighting:

Table 5. 4 Defective product in warehouse final score

Weighting	Target	Realization	Final Score
10	0,5%	0,71%	7,04

This result represents Maga's internal business process performance, which requires appropriate action to maintain and maintain inventory conditions, due to less demand from customers as last year, as a result, the warehouse left more unsold goods and warehouse cleanliness was one of the causes of product defects. increases, human errors are also found when employees check goods, there are dropped goods, imperfect packaging becomes a product in a defective warehouse. management needs to pay

attention to the cleanliness of the warehouse and the activeness of its staff in managing the goods placed in the warehouse. The need for monitoring from leaders and media to control warehouse conditions such as using list orders, first in and first out methods, daily temperature logs, and inventory control sheets for employees to maintain the condition and quality of products.

5.1.4 Learn and Growth Perspective Result

There are 2 measurement indicators of learning and growth, specifically measuring the level of employee satisfaction in the company and employee retention. The level of employee satisfaction uses questionnaires with 16 statements and 4 indicators, as well as for employee retention using the number of employees who resigned in the 2017 and 2018 periods.

5.1.4.1 Satisfaction Employee

Employee satisfaction is measured by 16 statements which include comfort at work, safety at work, work achievement, and attitudes towards company regulations. The first thing to do is to distribute 75 questionnaires to employees at random. After all the questionnaires were collected, the author again conducted a validity and reliability test, because the value r_{count} greater than r_{table} so the question item is valid. On the results of the reliability test, Cronbach Alpha's obtained is equal to 0,717 greater than 0,6 so the data is reliable because H_1 acceptable.

Table 5. 5 Satisfaction employee final score

Weight	Target	Realization	Score	Final Score
20	100%	87,85%	87,85	17,57

Followed by calculating the cumulative score, the specified interval is 1200 – 6000. For the satisfaction employee, the score is 5271 and it is categorized as very good performance, compared to other parameters, satisfaction employee placed on the top performance because it has the highest score. And realization score for Maga Swalayan

is 87,85% in some parts employee feels the workplace should be larger and renovated the workplace with interesting color, management should be aware to give additional air conditioner for the main office. Maga also needs to consider the freedom of speech of all employees, this can be circumvented by providing suggestion boxes special for the employee in the corners of the room.

5.1.4.2 Employee's Retention

Based on the calculation results of Maga's employee retention in 2017 and 2018, there are 2 differences, namely, in 2017 employee retention of 6.67% there were 5 people who left their jobs with unknown status. in 2018 there was an increase in the retention percentage of around 1.33 percent to 8%, it was found that 3 people resigned and 3 others without the company's knowledge. From these results, it can be concluded that the company's target for employee retention <10% is still achieved because the realization

Table 5. 6 Retention employee final score

Year	Weight	Target	Realization	Final Score
2017	5	<10%	6,67%	5
2018	5	<10%	7,3%	5

Based on the results of the weighting obtained a score of 3.7 with a realization of 7.3%. This achievement is good because it has succeeded in achieving the company's target where retention is expected to be less than 10 percent. Solutions so that companies can minimize employee departures include paying attention to employee welfare, providing adequate facilities so that work is easily completed, providing benefits in accordance with employee performance, and giving employees freedom of opinion for the progress of the company.

5.2 Concept of Transparency Result

For this evaluation, the author uses 1 pillar of Industry 4.0 to measure the readiness of Maga Swalayan to develop the following trend of Industry 4.0, the concept designs a method that is made practical and easy to understand to make it easier for Maga Swalayan

to achieve its readiness to follow industry 4.0 trend, this concept is designed using 2 aspects of "knowledge" and "resource capability". Where knowledge uses variable comprehension and accuracy, and resource capabilities use variable accessibility and flexibility. Based on Table 5.7 below the dimension are divided into several variables and Maga Swalayan has responded to it:

Table 5. 7 Transparency measurement dimension and variable

Dimension	**Variable**	**Maga Swalayan Response**
Accessibility	Easiness access information for the supplier to Maga Swalayan	3
	Near field communication using a device for the driver with security in the warehouse	1
	Tracking delivery with GPS to know the courier and product location	2
Flexible	Maga Swalayan able to move products from 1 store to another branch	5
	Automatically update status delivery to suppliers/store/partner	3
	Update the quantity inventory with internet access	4
Accuracy	Use real-time and data-driven information to enable decision making	3
	Calculation with Excel or additional Softwares	3
	Order quantity and Inventory capacity never exceed	5
Comprehension	Employee able to access Microsoft	4
	Managers understand the goal of transparency	5
	Maga Swalayan notice the capacity of inventory	5

	Communicative between employee and superior in warehouse	3

After the company gives responses regarding to questionnaire item, next step is calculating the index of readiness using each dimension (I_D) and the value for each dimension are $I_{D(A)}$ = 2,00; $I_{D(F)}$ = 4, $I_{D(acc)}$ = 3,7; $I_{D(C)}$ = 4,3. Index readiness for each dimension convert to diagram pie as shown in Figure 5.1 below

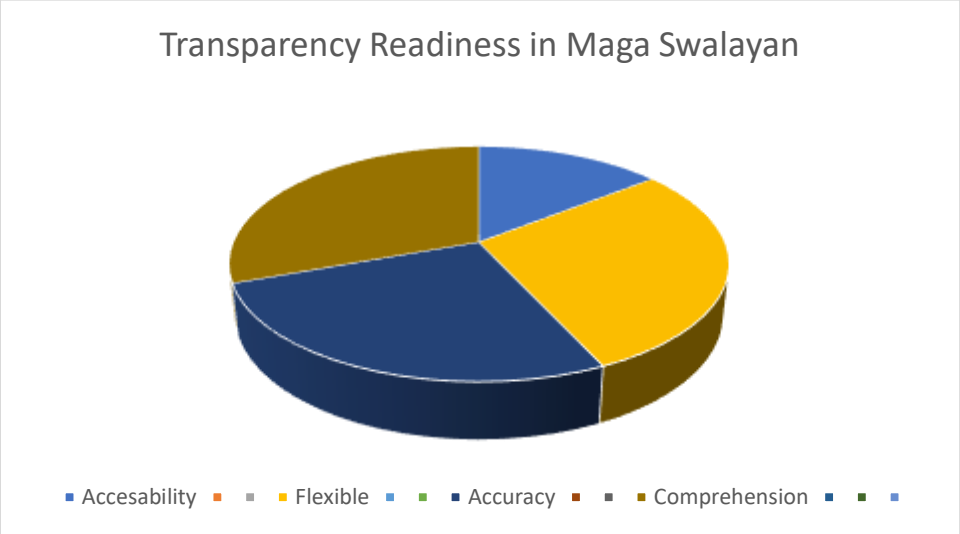


Figure 5. 1 Transparency readiness diagram of Maga Swalayan

To know the level of readiness, the last stage is calculating the aspect "knowledge" and aspect "resource capability" here is the result:

$$K_k = \frac{4,3+3,7}{2} = 4 \text{ dan } K_{rc} = \frac{2+4}{2} = 3$$

Based on these results, Maga Swalayan is conditional ready, which means Maga Swalayan still needs support and understanding about the concept of transparency and as well awareness to all of employee and department, this concept can occur if management build training to support all the ecosystem. This result can be formed into a quadrant

matrix to classify the readiness of Maga swalayan for transparency concepts, figure 5.2 represent the diagram:

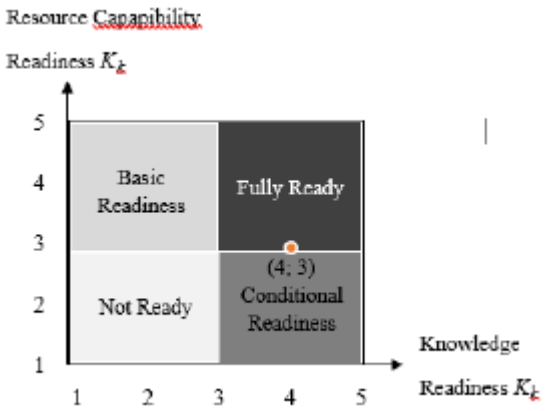


Figure 5. 2 Quadrant Matrix transparency readiness Maga Swalayan

Based on the result, Maga is in conditional readiness because the knowledge is already existed but resource capability still needs support from employees, training, and facility to achieve transparency concept in the right ways. Based on the table itself Maga should be aware of the utilization of Near Field Communication, since the device because gives a benefit for the transaction, the supplier can get proof from the delivery. Tracking delivery using GPS is important as well where the current situation Maga Swalayan only know the update by messenger or email, there is another solution by using Tokopedia or GPS tracking with live share location, shared to the supplier when delivery is scheduled, it can be used for management to get loyalty scale and honest level of their employees while there is transfer product from one store to other. For inventory control itself, it shares the time of order arrived and more preparation to receive and maintain the inventory in order. Since the defective product in inventory still under the target of efficiency, hence the transparency concept will be helpful to avoid defective products without clear reason.

Meanwhile, manufacturing companies that are in quadrant 4, at the "Fully Ready" level are companies that have both high KP and KK values. Companies in this quadrant are fully prepared to start the Industry 4.0 transformation process. Companies that are in quadrant 4 already have sufficient knowledge regarding Industry 4.0 and have the

necessary resource capabilities, require low direction and support, they just need the right motivation and momentum to immediately start the Industry 4.0 transformation process.

5.3 The result of Concept Industry 4.0 and BSC

From all the perspectives and transparency readiness in this subchapter will be explained the result of concept industry 4.0 and BSC. Based on the financial perspective result, it is known that the target of 12% sales growth has not been achieved in the previous period because the realization is still 6,37% in 2017 and for 2018 decrease to 5,73%, therefore sales in the next period need to be increased. To achieve this sales growth should be increased sales by reducing product defects in inventory so that the cost order balance. Intensify marketing of products that have a high demand value. Reduce unnecessary costs.

The right way to improve this is to increase sales results at department stores and reduce excessive costs, Maga supermarkets need to pay attention to customer service as well because based on the results of customer perspectives using customer satisfaction as a measurement Maga obtains a realization score of 78,94% which is Maga's target is 100% if customer satisfaction can reach the expected target then the sales value will increase, therefore Maga needs to pay attention to how employees serve buyers, pay attention to special days to provide the right promos and which products are suitable for promotion so that customers interested and buy in large quantities. So that employees can provide appropriate effort and satisfactory service because from the internal business process it is necessary to measure the employee performance index with select employees selectively and provide a training period in advance to get a 100% target. After all, the current realization is still at 84,2% because employees feel that a good performance appraisal is needed in the next period, and based on the defective product found at the warehouse, the final score in 2016 is 0,58% and 2017 score is 0,71% while the target only 0,5% this happens due to the insufficient employee qualification and the warehouse is not manage very well. Human error leads to imperfect packaging, which should be considered by Maga in the next period. The record of the defects in the warehouse should be maintained very well to avoid high defect numbers for the next period.

Therefore, the management needs to provide the right treatment and facilities so that employees can work optimally. To achieve this, the learn and growth perspective is the main basis for creating a quality workforce, therefore Maga needs to maintain the quality of employees because the current state Maga realization still 87,85% while the target is 100% by providing appropriate training, services that are in accordance with their workload and maintaining employee retention, which is currently employee retention is one of the achievements of Maga Self-Service because the result is 7,3% while the target is <10% this is a good achievement to stabilizing Maga performance in the next period. In a company, if the performance provided is optimal, then customer satisfaction will be achieved, and financial conditions will also follow.

To make these 4 perspectives more synergize, the concept of industry 4.0 by utilizing transparency readiness will create a transparent concept, can be monitored by management better, and preparation for industrial development will certainly be more flexible and accurate. Based on the transparency measurement, Maga still needs more support from the environment to achieve this, especially to maintain the employee and inventory, because based on the level readiness Maga has knowledge level 4 and level resource capability is 3, it means based on the knowledge Maga Swalayan already capable because as shown on the BSC internal business process as well, Maga has target 0,5% defect but the realization still at 0,73 it means the resource capability still need support from the manager, the facilities need improvement, and monitor from a leader is a must to achieve readiness transparency in the next period.

Based on Table 5.8 below the final score represents to the performance at Maga Swalayan for each perspective, based on the balanced scorecard method, there are measurements of financial and non-financial aspects that will be a tool for decision-making for management for the next period.

Table 5. 8 Perspective Weighting Final Result

No.	Perspectives	Final Score
1	Financial	16,61
2	Customer	19,73
3	Internal Business Process	19,67
4	Learning and Growth	19,66
	Total	75,67

The total score for performance measurement is 75,67, which means the performance **good** with some notes. Maga Swalayan should maintain the basis of Maga Swalayan must understand the basic value of the Balanced Scorecard measurement that learning and growth is the initial foundation for companies that are still in the **growth** category. Therefore, to achieve optimal and balanced results for each perspective, it is necessary to pay attention to how Maga Swalayan maintains its resources, products sales, and inventory management, employee welfare to be able to provide good service to customers to avoid complaints and bad rating, then pay attention to customer satisfaction with improving facilities and strategy marketing, so then sales will be increased by time, and the last one is eliminating unnecessary costs so that financially Maga Swalayan is able to achieve the target. Based on the result, the vision of Maga is realizing Maga Swalayan as a favorite shopping place for families, students, and the surrounding community still need to be aware of the value of satisfaction employee to maximize the performance follows with fulfilling customer satisfaction by educating employees to provide better service and placing goods in supermarkets properly.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Based on the analysis and discussion about evaluation of Maga Swalayan using the concept of industry 4.0 pillar based on the balanced scorecard, the conclusions about this research are:

1. Maga Swalayan has to prioritize improvement to customer satisfaction because the gap between realization and the target has the highest value 21,06% based on the result customers need preparation of products according to the type of goods better and active using media social to share advertisement and promos.
2. Employee performance should be maintained to avoid the highest value of retention value for the next period and Maga Swalayan should defend employee satisfaction in a good performance as well.
3. The final score of BSC is 76,43 it means Maga has a lot of space to improve and maintain the next period's performance to achieve their vision to give the best service to all of customers in Yogyakarta.
4. The facility in Maga Swalayan should be better for the next period to achieve good performance for employee and employee satisfaction.
5. Transparency concept state for inventory management is Conditional Readiness means Maga should get support from the environment to achieve this, specifically management should be aware of the tracking product in and out and facilitate near field communication for transparent transaction, less cost, and flexible

6.2 Recommendation

Responding to the conclusions that have been described, here are the recommendations by the author:

1. Maga Swalayan can organize uniforms for the employees and use attractive attributes and conduct training to the employee on how to interact with customers and give the best service.
2. The employee should be treated equally and fairly, management should care and give appraisal to the employee with good performance, and management needs to support the facilities at the workplace to keep employees comfortable.
3. Management should build a priority scale for improvement because BSC represents 4 perspectives, for the current state Maga should focus on improving customer satisfaction.
4. Workplace facilities should be appropriate especially for internet access and warehouse cleanness to avoid product defects because the score is still greater than 0,5% so management can initiate the coordination with the employee to maintain the inventory (warehouse) to be better for the next period.
5. The transparency concept is still not enough for measuring the readiness of Maga Swalayan, there should be follow up for the other pillars such as decentralization, interoperability, and internet of things to evaluate the readiness of Maga Swalayan in era Industry 4.0

REFERENCES

Abolfazl Danei, et al. (2014). Performance Measurement of Administration Services Using Balance Scorecard and Kano Model. *Management Science Letters*, 703-706.

Ala-Risku, T. and Ka¨rkka¨inen, M. (2006). Material delivery problems in construction projects: a possible solution. *International Journal of Production Economics*, 19-29.

Amri, H. D. (2014). KAIZEN-SIX SIGMA TO IMPROVE PIPELINE PROJECT PERFORMANCE BASED ON BALANCE SCORECARD FRAMEWORK. *The 4th International Conference on Technology and Operations Management.* Kuala Lumpur: ICTOM.

Armstrong, M. &. (1998). *Performance Management: The New Realities.* London: London: Institute of Personnel and Development.

Curtis S. and Wright. (2001). Retaining employees—the fast track to commitment. *Management Research News*, 59-64.

Dainty, A.R.J., Briscoe, G.H. and Millett, S.J. (1999). New perspectives on construction supply chain integration. *International Journal of Logistics Management*, 97-112.

Davies, R. (2015). Industry 4.0 Digitalisation for Productivity and Growth.

D'souza, R. (2007). Application Of The Balance Scorecard In Strategy Application At Barclays Bank. *Unpublished MBA project*.

F.Mosconi. (2015). *The New European Industrial Policy: Global Competitiveness and Manufacturing Renaissance.* London: Routledge.

Gibson J., Ivancevich J., & Donnelly J. (1979). *Business Publications Inc.* Organizations (3rd Ed).

Gouws, A. (1995). *The relationship between motivation and job satisfaction of a group of information specialists.* Johannesburg: Rand Afrikaans University.

Hermann et al. (2017). Design Principles for Industrie 4.0 Scenarios. *Presented at the 49th Hawaiian International Conference on System Science* (hal. 1530-1605). Koloa, HI: IEEE.

Hugo Afonso and Maria do Rosário Cabrita. (2015). Developing A Lean Supply Chain Performance Framework in a SME: a perspective based on the balanced scorecard. *Procedia Engineering 131*, 270-279.

I gusti Agung, Ida Bagus Rai. (2013). *KEGIATAN USAHA DAN PERKEMBANGAN MINIMARKET DI KABUPATEN BADUNG*, 2.

INDUSTRY 4.0 OPPORTUNITIES BEHIND THE CHALLENGE. (2017). VIENNA: UNIDO GENERAL CONFERENCE 17.

Kagermann H., Wahlster W., Helbig J. (2013). *Recommendations for implementing the strategic initiative INDUSTRIE 4.0 In Final Report of The Industrie 4.0 Working Group.* Frankfurt am Main: Acatech.

Kapalan, R.S. and Northon, D. P. (1992). *The Balanced Scorecard: Measures That Drive Performance.* Cambridge: Harvard Business Review.

Kaplan and Northon. (1996b). *The Balance Scorecard: Translating Strategy Into Action.* Boston: Harvard Business School Press.

Kaplan and Northon. (1996b). *The Balanced Scorecard: Translating Strategy Into Action.* Cambridge: Harvard Business School Press.

Kaplan and Northon. (2000). In *Balance Scorecard: Penerapan Strategi Menjadi Aksi* (pp. 112-114). Jakarta: Erlangga.

Kaplan, R. S. and Northon, D.P. (1996). *The Balance Scorecard: Translating Strategy Into Action.* Boston: Harvard Business School Press.

Kaplan, R.S. and Northon, D.P. (1993). *Putting the Balanced Scorecard to Work.* Cambridge: Harvad Business Review.

Kelter, P. (2018). Assessment in Academia. *The good, the bad and the ugly*, 113-119.

Kiran Jude Fernandes, et al. (2006). Lessons From Implementing The Balance Scorecard in a Small and Medium Size Manufacturing Organization. *Technovation*, 62-634.

Kohlegger, M., Maier, R. and Thalmann, S.,. (2009). *Understanding Maturity Models Results of a structured Content Analysis.* Austria: IKNOW ’09 and I-SEMANTICS ’09.

Lawler, E. (1981). *Pay and Organization Development.* Reading: Addison-Wesley.

Lu, Y. (2017). Industry 4.0: A survey on technologies, applications, and open research issues. *Journal of Industrial Integration*, 1-10.

M. Hermann, et al. (2016). Design Principles for Industrie 4.0 Scenarios. *Proceedings of The Annual Hawaii International Conference on System Sciences*, (hal. 3928-3937).

Mahsun, M. (2006). *Akutansi Sektor Publik.* Yogyakarta: BPFE UGM.

Maris Martinsons, et al. (1999). The Balance Scorecard: A Foundation for The Strategic Management of Information System. *Decision Support Systems*, 71-88.

Martinsons, M. Davison, R., & Tse, D. (1999). The Balanced Scorecard: A Foundation for The Strategic Management of Information Systems. *Decision Support Systems 25*, 71-88.

Morse, N. C. (1997). *Satisfactions in the white-collar job.* Ayer Publishing.

Mulyadi. (2001). *Balance scorecard: alat manajemen kontemporer untuk pelipat ganda kinerja keuangan perusahaan.* Jakarta: Salemba Empat.

Mulyadi dan Setyawan. (2001). *Sistem Perencanaan dan Pengendalian Manajemen.* Jakarta: Salemba Empat.

Nikos Kartalis and John Velentzas. (2013). Balance Scorecard and Performance Measurement in A Greek Industry. *Procedia Economics and Finance 5*, 413-422.

Paula Mendes, Ana Carina Santos, et. al. (2012). The balanced scorecard as an integrated model applied to the Portuguese public. *Journal of Cleaner Production*, 20-29.

Rajat Bhagwat and Milind Kumar Sharma. (2007). Performance Measurement of Supply Chain Management: A Balance Scoreard Approach. *Computers & Industrial Engineering 53*, 43-62.

Reiner, A. (2014). Industriee 4.0 - Advance Engineering of Smart Products and Smart Production. *19th International Seminar on High Technology*.

S.I. Shafiq, et. al. (2015). Virtual Engineering Object (VEO): toward experience-based design and manufacturing for Industry 4.0. *Cybern. Syst.*, 35-50.

Sujana, A. (2012). *Manajemen Minimarket.* Bogor: Raih Asa Sukses.

Susskind, et al. (2003). Customer service providers' attitudes relating to customer service and customer satisfaction in the customer-server exchange (CSX). *Journal of Applied Psychology*, 179-87.

Tripathi R. & Kumar A. (2018). *Importance and Improvements in the Teaching-Learning process through Effective Evaluation Methodologies* (Vol. 9). Thousand Oaks, CA: ESSENCE Int. J. Env. Rehab. Consery.

Viharoz, e. a. (2017). *Non-comparative, Industry 4.0 readiness evaluation for manufacturing enterprises.* Technical Diagnostics in Cyber-Physical Era, 15th IMEKO TC10 Workshop on Technical Diagnostics.

Wu J., et. al. (2013). Customer Knowledge Management and IT-enabled Business Model Innovation: A Conceptual Framework and A Case Study From China. *Eur. Manag. J.*, 359-372.