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Strategy Of Micro, Small And Medium Enterprises In Facing Inflation (Case at Warteg in Semarang City)

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Abstract–The purpose of this study is to identify the potential and characteristics of MSMEs in Warung Tegal and to analyze internal and external factors as a business strategy for dealing with inflation. The data was analyzed using the strengths, weaknesses, opportunities, and threats (SWOT) method. MSMEs of Warung Tegal has the same characteristics in production, marketing, human resources, finance, law, and support from related agencies. In addition, its production uses a manual process, Warung Tegal sells its products through offline stores directly with 2-10 employees. Capital is relatively low and some MSME units of Warung Tegal have legality and well-managed management. Local governments play an important role in developing MSMEs in the face of inflation. Its main strength is the local supply of raw materials and the strategic location of the business, and the main drawback is the limited labor ability due to lack of training. The main opportunity is the trend of high public demand and open business partnerships, but they also face fierce competition as the main threat. MSMEs strategies in dealing with inflation include increasing cooperation to maintain the continuity of raw materials between regions, developing MSMEs service innovations, and increasing the role of local governments.
Keywords: *strategy, MSMEs, SWOT, inflation, warung tegal*

INTRODUCTION

Indonesia faces its highest inflation in seven years in July 2022, but economists project inflation will get worse in 2023. Inflation this year is at 6% and is expected to worsen next year. Because the bearing subsidy is taken from the export income of the mainstay commodity which is expected to fall in price next year (Yanescha, 2022). In July 2022, the Central Statistics Agency recorded a year-on-year increase in prices by 4.94%. The figure was 6.25%, the highest since October 2015. Inflation in July 2022 was mainly due to rising food and beverage prices, according to BPS. Finance Minister Sri Mulyani said the figure was relatively small compared to countries at the Indonesian level such as Thailand (7.7%), India (7%) and the Philippines (6.1%) (Feranika & Haryati, 2020).

In Central Java itself, Adhi Wiriana, head of the Central Statistics Agency, said inflation in the province reached 0.51 percent in July 2022. He said the increase in the price of red pepper and red onion became one of the triggers of inflation, while the increase in the price of air tickets and chicken also contributed to the increase in prices. The Consumer Price Index survey was conducted in six major cities, Semarang and Tegal have the highest inflation rates, both higher than Central Java. The cities with the highest inflation rates are Tegal and Semarang, each at 0.59% (Marpaung et al., 2022).

The impact of this inflation also has an impact on small and medium enterprises (MSMEs). One of the MSMEs that is currently developing is in the culinary field, namely Warteg (Warung Tegal). Warteg itself is a simple food stall serving typical Indonesian food, and the owner usually comes from the district or city of Tegal in Central Java. Many Indonesians themselves prefer Tegal food because of its affordable price in addition to the delicacy of the food. Warteg has a wide variety of cuisines and consumers can choose

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their own. Warteg always has visitors from various circles: students, middle class and even upper class who like warteg cuisine.

If the price of red pepper and red onion rises, this can be inflation and economic impact for Warteg entrepreneurs. This condition causes reduced income for warteg entrepreneurs and can even cause warteg stores to close. In Jakarta alone, less than half of Warteg traders choose to return home because income continues to decline due to limited demand. In addition, the chairman of the Warung Tegal Nusantara community himself reported that wareg traders ' income continued to decline, there were even rumors that 20,000 wareg were out of business. The issue was disputed by Chief Kowantara Mukroni (Lutfi et al., 2020).

In addition to the rising prices of red taxis and shallots, Warung Tegal or Warteg entrepreneurs also lost the permanence of 3 kg of LPG due to the immigration of many users of 5.5 kg of diesel and 12 kg of LPG without subsidies. PT Pertamina again set the price of LPG Bright Gas around Rp 2,000 per kg. This regulation will set the selling price of LPG 5.5 kg without subsidy of Rp 11,000 per bottle and Rp 24,000 per bottle of LPG 12 kg. Kowantara Mukroni added, the scarcity of LPG 3 kg makes entrepreneurs have to spend more on operating costs along with rising prices of various commodities. This makes many successful entrepreneurs, choose to close temporarily while waiting for prices to return to normal (Widya Yudha et al., 2018).

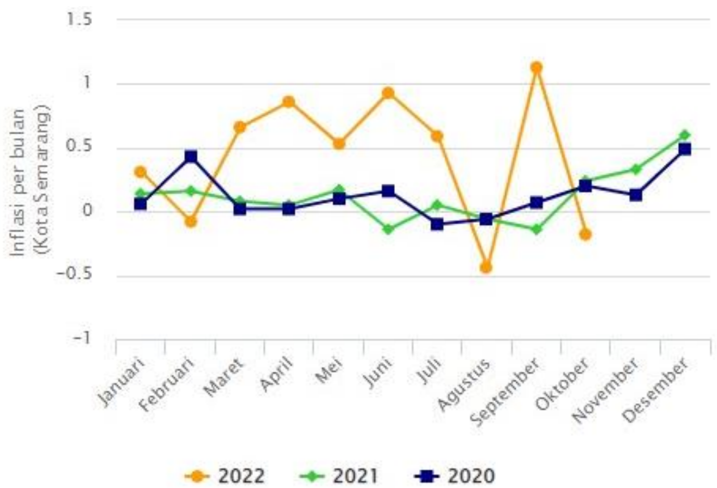

Figure 1. Inflation rate in Semarang City in 2019 s.d. 2021

Conditions in the city of Semarang itself, inflation is not so high, which ranged between 0.59% caused by rising prices of shallots, cayenne pepper and chicken egg price increases. And lately also followed by an increase in rice prices, the governor of Central Java himself has suggested for farmers to take advantage of existing compost fertilizers, and the governor also suggested that farmer groups can make their own fertilizers (Cahyanti & Fevriera, 2020). This, of course, more or less will be able to have an impact on MSMEs, one of whose sectors is in the culinary field, namely Warteg.

From the distribution of Warteg in the city of Semarang, based on calculations from researchers there are 121 Tegal stalls from 16 districts in the city of Semarang, which include Banyumanik District, Candisari District, Gajahmungkur District, Gayamsari District, Genuk District, Gunungpati District, Mijen District, Ngaliyan District, Pedurungan District, West Semarang District, South Semarang District, Central

Semarang District, East Semarang District, North Semarang District, Tembalang District, and Tugu District.

Based on the above conditions, it is necessary to identify the strategy of MSMEs engaged in the culinary field, with a focus on Warung Tegal in Semarang to deal with inflation. This study focuses on several subdistricts in Semarang city which is the location of Warung Tegal commodities and is expected to experience the highest inflation, or the central part of Semarang City. The purpose of this study is to: (1) to determine the impact of inflation on SMEs culinary sector Warung Tegal. (2) analysis of internal environmental factors (strengths and weaknesses) of Warung Tegal MSMEs and external (opportunities and threats) in the culinary sector, (3) Warung Tegal in the face of inflation to increase the scale of MSMEs in the culinary sector, an overview of the strategy.

Inflation

The Theory of inflation, Rios et al., posits inflation as an increase in the general price level, noting that inflation is a general increase in prices of goods/ commodities and services over a period of time. From the definition indicates a state of weakening purchasing power followed by a decline in the real (intrinsic) value of a country's currency (McConnell & Brue, 2020; Rosa, 2021).

Factors that affect inflation, namely: (1) inflation due to the pull of demand, inflation is inflation from the demand side caused by an increase in demand (consumer household spending, investment, government spending and foreign sector exports minus imports). (2) inflation due to supply impulse, this inflation is inflation from the supply side caused by production cost impulse and distribution distortion (Feranika & Haryati, 2020).

Inflation also has some effects on Business. Inflation can affect the company's operating costs in order to improve its products and increase the price of equipment and raw materials. Higher inflation further increases operating costs for businesses. Corporate profits are also higher during periods of high inflation, as many companies charge higher prices. Cost-driven inflation occurs when firms set higher prices (Alamsyah et al., 2021).

Micro, Small and Medium Enterprises (MSMEs)

Micro, Small and Medium Enterprises (MSMEs) the definition of Micro, Small and Medium Enterprises (MSMEs) is not always the same in all countries due to the concepts used. The definition of MSMEs according to Article 1 of Law No. 20 of 2008 is: (2) small business is a person or entity that is run by a person or entity that is not a subsidiary or branch of a company that is directly or indirectly owned, controlled, or part of a medium or large business: a clear productive economy. company. SME criteria within the meaning of this law. (3) a medium-sized company is a subsidiary or productive economic company that stands alone and is run by a natural person or a business unit that is not a branch, thus making the company a domestic company. The meaning of this law (Wijoyo & Akbar, 2021; Katon Nuraharto, 2021).

MSME criteria according to law No. 20 year 2008 measured by net worth and turnover: (1) micro enterprises have a maximum net worth of Rp50 million and a maximum turnover of Rp300 million. (2) SMEs have assets of Rp 50-500 million and turnover of Rp 300-25 billion. (3) medium enterprises with assets between Rp500 million to Rp10 billion and turnover between Rp2.5 billion to Rp50 billion. (4) MSME criteria can also be seen from the number of workers, such as micro enterprises with a workforce of less than 10 people, small enterprises with a workforce of less than 30 people, and medium enterprises with a workforce of less than 30 people. Maximum of 300 employees (Katon Nuraharto, 2021).

Determining factors for increasing the scale of Micro, Small and Medium Enterprises

The determining factor for the expansion of the scale of Micro, Small and Medium Enterprises (MSMEs) the modernization of a company is related to the growth of the company itself, in this case the growth of small and medium production units, through the innovation process. Several references present different concepts to explain this in terms of company characteristics, corporate networks and business environment. In this study, the term upgrade refers to the growth of Micro, Small and medium enterprises (MSMEs) resulting from various types of innovation. In this context, innovation can be defined as the same approach but different in the processes and methods of non-entrepreneurial initiatives or direct competitors. (McWilliam et al., 2020).

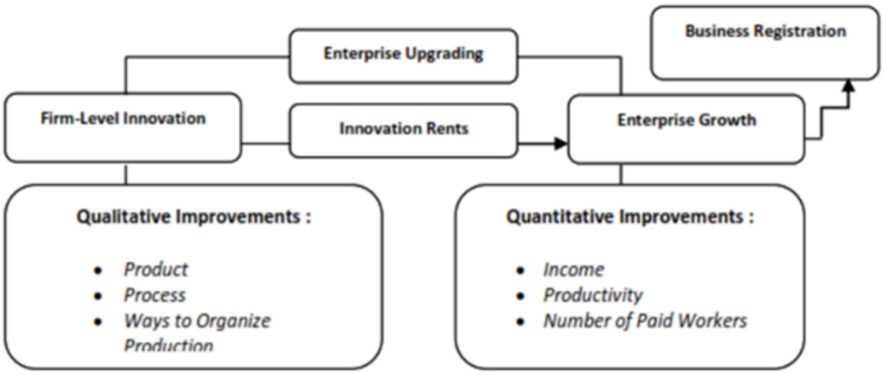

Figure 2. Entreprise Upgrading Concept

Simply put, business transformation better known as business improvement is the growth of a business through the innovation of various internal and external business factors such as revenue, business profitability, number of assets and employees, as well as government policies, and strategies to drive development. Basically, the term connects two important aspects in business development: qualitative and quantitative. Every business has the ability and opportunity to develop, so business transformation is required (expanding the market, increasing demand, competitive prices). However, business transformation focuses on business growth strategies through innovation that are directly under the control of entrepreneurs and are highly dependent on external factors (Ridwan Maksum et al., 2020).

One of the reasons to study the determinants of the growth of micro, medium and small enterprises (MSMEs) in Semarang in the culinary field is the result of empirical research conducted by previous researchers on the topic of this study. This research is based on the basic theory of the theory of corporate growth through production, production costs, and profit maximization. At the corporate level, in this case we assume that Micro, Small and Medium Enterprises (MSMEs) production units generally aim for the growth of the company in terms of assets, profits, labor and also quantitative factors. This study focused on the work of Cho et al., (2020); Flores et al., (2020); Ridwan Maksum et al., (2020) on 297 new small business units in Romania. The study explores why small businesses can grow to some extent. The answer is to reduce access limitations to banks, improve sales performance and improve employee skills. In addition, the

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Romanian tax system can be an obstacle for small businesses to conduct business formally.

Hampel-Milagrosa conducted research on the model of increasing SME entrepreneurship in the Philippines using the approach of internal and external factors of MSMEs progress and innovation. There are three factors that boost SME businesses in the Philippines: the education level of business owners, the infrastructure that enables them, and government policies that drive MSMEs growth. The human capital factor is very influential in motivating MSMEs to cooperate with other companies to develop and maintain business networks that are open to innovation. Imbalances in government policies to support SMEs have also severely hampered Philippine companies from growing and producing on a large scale (Flores et al., 2020). Ridwan has done the same in Indonesia, with the support of the government, following the recommendations of the results to improve human resources, business networks and the stability of the business environment (Ridwan Maksum et al., 2020; Irhamni, M. R., & Rahardja, 2022).

METHODOLOGY

Design, Population and Research Sample

The strategy of MSMEs to face inflation requires more complete information on entrepreneurial characteristics, entrepreneurial characteristics, personal networks, professional networks, business environment and corporate formalization. Therefore, a more comprehensive study is needed, with an exploratory research approach to obtain empirical evidence based on literature reviews and statistical approaches with comparisons with reality in the field (Bougie & Sekaran, 2019). The design of this study was developed to identify strategies of Micro, Small and medium enterprises in the face of inflation in Semarang City Warteg. This is a key factor in translating company size into increased profits from manufacturing activities. get out. The population is determined based on the regulation of the Minister of Cooperatives and MSMEs of the Republic of Indonesia in 2010, which reflects the content of Law No. 20 of 2008 on small and Medium Enterprises and standards of the central authority of Indonesia. The location of this study is the city of Semarang, one of the cities in Central Java province consisting of 16 districts as the location of the center of Micro, Small and medium enterprises (MSMEs). has the greatest potential. The selection of samples was carried out in stages on a total of 40 samples from 121 Warung Tegal businesses using the multistep sampling procedure.

Data Analysis Techniques

the culinary sector such as Warung Tegal in Semarang city is carried out by adopting the input, matching and decision-making stages, the stages of strategy formulation by (AlQershi, 2021). Namely: (1) the Input stage, researchers make a matrix of intrinsic factor (EFI) and extrinsic factor evaluation (EFE). The EFI Matrix covers the strengths and weaknesses of MSMEs. Meanwhile, the company's opportunities and risks are described in the EFE Matrix. (2) matching stage, the SWOT matrix is made to make four strategies. Namely, strategies containing (a) strengths and opportunities (so strategy), (b) weaknesses and opportunities (wo strategy), (c) strengths and threats (St strategy) and (d) weaknesses and threats (WT strategy) (Yuanita et al., 2018; Benzaghta et al., 2021). The value is obtained from the multiplication of weights and the value of attraction (attraction score, or AS) ranging from 1 s/d 5 (score 1 = very unimportant, score 2 = not important, score 3 = rather important, score 4 = important, and score 5 = very important) (Sayyid et al., 2022).

RESULT AND DISCUSSION

The impact of inflation on MSMEs in the culinary field Semarang City

The development of the number of restaurants/ restaurants by district/ city in Central Java province continues to grow every year. In 2019, the number of restaurants in Semarang according to data from the Central Statistics Agency of Central Java province was 160,000 or 27% of the development over the past three years from 2019-2021. In 2020, the number of restaurants in Semarang itself increased to 224,000 or 38% of the development over the past three years. Which means that from 2019 to 2020, the number of restaurants in Semarang increased by 11%. Meanwhile, in 2021, the number of restaurants in Semarang city decreased by 3% which became 35%, in this sense the number of restaurants in Semarang city in numbers became as many as 211,000. From this information, it can be concluded that the potential for increasing the scale of MSMES restaurants and the like in Semarang city increased in 2020, and decreased in 2021. This is certainly due to the impact of Covid 19 which makes economic growth in any sector weaken, and after Covid-19 which occurred in 2022 also caused inflation in various sectors.

Based on the results of field research with the focus group discussion method, it was found that the number of MSMEs engaged in the culinary or Warung Tegal in Semarang city has the following characteristics: 2) job creation; (3) quality production by paying attention to hygiene and sanitation factors, good manufacturing processes or failure to apply Critical Control Points for Hazard Analysis; (4) marketing; local fixed coverage, (5) contribute to local revenue, (6) finance can be easily managed, (7) continuity of production can be maintained, and (8) elements of labor protection failed to be applied, (9) business partnerships between regions and between companies do not work well. established;

In addition, based on the field research, it was also found that Warung Tegal was affected by inflation in 2022, the impact of inflation was in the form of: (1) an increase in the price of non-subsidized Liquefied Petroleum Gas (LPG), (2) the price of basic necessities such as meat, chili and others increased, and (3) the cost of renting a place increased. This certainly makes Warung Tegal entrepreneurs become restless, because in this case the entrepreneur is in the corner on two conditions when it will increase the selling price of food it can potentially be abandoned by customers, while if it will continue to consistently maintain the selling price of food and maintain to get smaller profits, it will be at great risk to the Warung Tegal entrepreneurs to be unable to pay annual rent.

Internal and external factors of Warung Tegal SMEs in Semarang

Internal and external aspects of Warung Tegal MSMEs in Semarang City are the basis for increasing the scale of MSMEs in creating productivity and business profits in the future. Based on the results of field observations through the filling of questionnaires on 40 Tegal stalls as a sample, can be formulated internal conditions (strengths and weaknesses) and external conditions (opportunities and threats) Tegal stalls. The internal condition of Warung Tegal SMEs in Semarang is formulated based on aspects of strengths and weaknesses, namely:

Table 1. Matrix evaluation of internal factors (EFI) scale-up of MSMEs

Internal factors of increasing the scale of MSMEs	Weight	Rating	Score
Strengths	**[a]**	**[b]**	**[a]x[b]**
Locally based and readily available raw materials	0,098	4,9	0,479
Have a business brand	0,087	4,3	0,373
Good command in English both oral and written	0,088	4,4	0,386
Regional specialties	0,089	4,4	0,395
According to the taste of society	0,092	4,6	0,417
Affordable product prices	0,092	4,6	0,422
Gender majority female business owners	0,082	4,1	0,331
Significant business experience	0,088	4,4	0,381
The decision to take a business risk	0,098	4,9	0,474
Production costs are quite low	0,089	4,4	0,390
Easily accessible business location	0,098	4,9	0,479
Weakness	**[a]**	**[b]**	**[a]x[b]**
Production capacity is low	0,077	2,4	0,183
Technology adoption is low	0,083	2,6	0,210
Less attractive packaging	0,075	2,3	0,175
Product quality assurance system is still low	0,073	2,3	0,164
Limited business capital	0,087	2,7	0,236
Marketing is regional	0,108	3,4	0,363
Limited workforce training	0,112	3,5	0,385
Market share is still low	0,102	3,2	0,321
The level of education of business owners is still low	0,100	3,1	0,306
Knowledge of formalization and business taxes are still low	0,097	3,0	0,291
Turnover and business assets are still low	0,087	2,7	0,232
Total Internal factor Evaluation Matrix (EFI) score			**7,392**

Source: Authors

Based on Table 1, the assessment of internal factors including strengths and weaknesses based on FGD and questionnaire responses showed that the main strength of Warung Tegal MSMEs in the face of inflation with the highest score is the availability of raw materials available locally. It can be said that it shows that there is balanced with accessible business locations (0,479). This can be seen by the increase in raw materials from locally available well, then the entrepreneurs of Warung Tegal will be able to defend themselves from the threat of inflation, because the state does not need to depend on imported raw materials and can also improve the welfare of the people connected in the raw material providers (suppliers/ farmers). On the other hand, what can be a strength for Warung Tegal in facing the threat of inflation is an easily accessible business location, in this case the business location is one of the main strengths, especially for MSMEs in the culinary sector, in conditions of the threat of inflation, customer loyalty is less a main focus for MSMEs actors, especially Warung Tegal, because in this condition customers can be a lot of alternation and of course a strategic location is the main key to be easily reached by new customers. While the main weakness with the highest score (0.385) is the limited training of the workforce. This is expected to be the main advice for MSMEs entrepreneurs in the culinary sector, especially Warung Tegal entrepreneurs, in this case the employees want to be given qualified workforce training so that the workforce can serve consumers well and can also provide customer satisfaction. In this case it is also recommended that entrepreneurs Tegal stalls began to pay attention to the ability of its employees, both in charge of serving customers directly, cashier and cook technician.

Table 2. External factor Evaluation Matrix (EFE) of MSMEs scale improvement

External factors increasing the scale of MSMEs	Weight	Rating	Score
Opportunities	**[a]**	**[b]**	**[a]x[b]**
Public demand Trend is quite high	0,132	4,7	0,619
Pemko/BUMN/BUMD assistance and construction	0,099	3,5	0,347
Support and facilitation of private parties (companies)	0,093	3,3	0,308
College support and mentoring	0,098	3,5	0,337
Potential products in culinary tourism	0,113	4,0	0,453
Business partnerships with retailers (outlets) open	0,132	4,7	0,619
Government assistance HAKI, POM, and PIRT	0,091	3,2	0,295
Pattern of business partnership with modern retail	0,115	4,1	0,470
Sales through online media	0,125	4,4	0,548
Treath	**[a]**	**[b]**	**[a]x[b]**
Sufficient substitution raw materials available	0,113	4,7	0,526
The number of MSME actors in the same sector	0,118	4,9	0,573
The number of foreign products such as Warteg and the like	0,102	4,2	0,429
Market competition with different business scales	0,108	4,4	0,477
Unbiased government regulation	0,098	4,0	0,394
Convoluted business permit management	0,098	4,0	0,394
Limited banking access (business credit)	0,097	4,0	0,390
Interest rates are too high	0,091	3,7	0,338
Regional inflation rate fluctuations	0,088	3,6	0,316
Rupiah exchange rate fluctuation	0,087	3,6	0,311
Total external factor Evaluation Matrix (EFE) score			**7,392**

Source: Authors

Based on Table 2 above, it can be determined the evaluation of external factors that include opportunities and threats based on Focus Group Discussion and questionnaire filling showed that the main potential factors for MSMEs Warung Tegal in the face of inflation with the highest score is the trend of public demand is high enough and business partnerships with retailers (outlets) open with the same score of 0.619. This of course can make opportunities for MSMEs actors to take advantage as much as possible by taking advantage of high community trends, for example when the Covid 19 virus is widespread in parts of the world, many Indonesian people are starting to pay attention to consuming herbal drinks such as herbs, this can be the main opportunity for MSMEs actors, especially Warung Tegal, to be able to provide these drinks. Furthermore, the other main opportunity is a business partnership with an open retailer, in this case it is expected to provide advice for the government so that the existing Warung Tegal businesses are still

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allowed to operate and maintained security, because not a few Warung Tegal entrepreneurs still feel their security in trading is still not well maintained. The main threat is Warung Tegal with the highest score (0.188), but the number of businesses in the same sector. This resulted in the placement of MSMEs in culinary hubs that were not strategically aligned through government directives and plans related to corporate competition in the culinary field, where the products traded were the same, resulting in very high competition. Therefore, Warung Tegal MSMEs must strive to have different characteristics from other competitors. For example, Warung Tegal MSMEs can differentiate their services with buffets that give customers the opportunity to eat their favorite foods.

Warung Tegal MSMEs strategy in facing inflation in Semarang City

Generically, the scale of business according to MSMEs in the Warung Tegal cuisine sector will develop if they have the strength to use local standard ingredients, use products that pay attention to brands, halal certificates, local special characteristics, synchronous community preferences, affordable prices, experience, production & strategic locations. However, the development of MSMEs in the Warung Tegal food sector is constrained by the weaknesses of MSMEs themselves, especially in production capacity, technology adoption, packaging, quality systems, business capital, employment energy development, market share, and also their own business turnover. Another influencing factor is opportunities & threats. MSMEs in Warung Tegal's food sector have the opportunity to grow due to several external factors, namely the dominant expression of public demand, donations & training according to the government, support & facilities from other parties, the potential for their own culinary tourism, business partnerships using open retailers, HAKI donations to PIRT, the latest business partnership patterns & social media. On the other hand, MSMEs in the Warung Tegal food sector must be able to anticipate the threat of substitution ingredients, competition for the same product, fluctuating standard ingredient prices, & lack of implementation according to government regulations and the impact of unstable economic conditions (interest rates, inflation, & Rupiah exchange rate).

Based on the evaluation of the EFI and EFE matrices (Tables 1 and 2), Warung Tegal'S MSME strategy to combat inflation in Semarang can be formulated. Strategy development is done by seizing opportunities to strengthen strengths, reduce weaknesses, and overcome threats. The formulation of the strategy was made based on the results of the FGD targeting MSMEs in Warung Tegal Semarang. Strategy formulation is done in SWOT Matrix, combining the four combination strategies above (so, WO, ST, and WT strategies) to produce alternative strategies as follows: 1) The government provides locally-based raw materials to meet the growing community trend and also open safe business partnerships; 2) Warteg entrepreneurs are expected to review business locations to take advantage of the trend in the community and also open secure business partnerships; 3) Business actors are expected to improve workforce training to meet the growing trend of society and also open business partnerships; 4) The government is expected to provide locally based raw materials to meet the number of Warung Tegal MSMEs in the same sector; 5) Warteg entrepreneurs are expected to review their business locations in order to face competitors, namely MSMEs actors in the same sector; and 6) MSMEs business actors are expected to provide training for their workforce, in order to be more active and innovative in providing ideas and services to customers which to deal with the number of MSMEs actors in the same sector.

CONCLUSION

Conclusions and suggestions that can be given to MSMEs Warung Tegal from research conducted for MSMEs Warung Tegal on how to overcome inflation in the city of Semarang is the improvement of MSMEs management itself is related to: [a] initiation of the owners of Warung Tegal when raw materials are difficult to find, [B] review of business locations that are easily accessible and strategic, [c] training of the workforce, [d] fulfillment of customer demand trends, [e] opening hours of outlets that must be consistent, and [f] innovation in dealing with competitors in the same sector. Suggestions that can be given to the government, especially the city of Semarang are: [a] maintaining the availability of raw materials, especially locally based for MSMEs, [b] ensuring business security wherever entrepreneurs open their business fields, and [c] providing assistance and providing a strategic location for MSMEs actors.

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The Effect Of TQM Practices On Operational Performance In Energy Sector Companies

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Abstract–This study aims to determine whether there is an influence of TQM Practice on operational performance in energy companies in Indonesia. The sample selection method in this study is Purposive Sampling in employees who work in the field of energy, Data collection using surveys in the form of questionnairesusing SEM statistical analysis tools processed through AMOS 26 software. The results of hypothesis testing show that process management has a positive and significant effect on performance, while top management support, customer focus, employee empowerment and engagement, continuous improvement, education, and training have no significant effect.
Keywords: *TQM Practices; operational performance*

INTRODUCTION

People are now smarter in choosing goods or services that have good quality. Therefore, many companies are trying to improve the quality of the goods or services they produce to maintain customer trust in the company. It is difficult for companies to survive unless they improve the quality of the company (Bajaj *et al*, 2018). Companies are encouraged to improve quality in terms of services, products and also processes of daily operations. As for research conducted by Herzallah et al, (2014) stated that quality is a very relevant concept and a strategic key factor that plays an important role in organizational success.

In improving the quality of the company, managers can be assisted by the concept of Total Quality Management (TQM). TQM is considered as a continuous process that leads to the overall development of the organization in terms of performance with the involvement of every individual associated with the organization (Bajaj *et al*, 2018). TQM has an important and beneficial influence for value development on employees and companies. By focusing employees on quality management and continuous improvement, companies can build and maintain values that drive long-term success for customers and companies (Hudnurkar *et al*, 2022). TQM focuses on identifying skills gaps in the workforce and providing the training, education, and mentoring needed to address those gaps (Hudnurkar *et al*, 2022). Based on the background described above, this study aims to see the influence of TQM Practices on Operational Performance in Energy Sector.

LITERATURE REVIEW

Total Quality Management (TQM)

Concept of TQM first appeared in 1949 after World War II. At that time scientists, academics, and strategists from Japan worked together to develop a TQM process that could improve the quality of life in Japan (hudnurkar et al, 2022). According to Oakland (2014), TQM refers to "a set of systematic activities carried out by the entire organization effectively and efficiently to be able to achieve organizational goals in terms of providing products and services with a satisfactory level of quality to customers, at the right speed of time and price". TQM principles are daily practices taken with the aim that companies can meet and achieve quality management goals (Quang et al., 2016). Sajan et al., (2017) also argue that the values, objectives, and objectives related to TQM are aimed at being able to achieve customer satisfaction. Taylor et al., (2020) added that maximizing profits, reducing operational costs, and increasing company productivity and efficiency are also the values and objectives of TQM. Total Quality Management or often abbreviated as TQM is a quality management system that focuses on Customers (Customer focused) by involving all employees in making continuous improvements or improvements. There are eight elements in TQM (Total Quality Management), namely: Customer Focused, Total Employee Involvement, Process-centered, Integrated System, Strategy and Systematic Approach, Continual Improvement, Fact-based decision making, and Communications.

Operational Performance

Operational performance can be said to be a vital aspect of the company, which can show how well the activity in carrying out a process or the results of a process are useful for achieving certain goals (Faeq et al., 2021). The purpose of operations is to minimize costs and increase efficiency in conducting the company's daily operations (Sharma and Modgil, 2019, Acquah et al, 2022). Operational performance relates to the measurement of process results within the company such as consistency, production time, and inventory turnover (Thoumy et al, 2022). According to Purbowo and Waluyowati (2022), quality is a demand for every company to compete well. In improving operational performance, companies need to pay attention to all aspects in the company. The company's performance can be measured by several aspects of assessment that in the future can enable the company to operate the business effectively and efficiently. In assessing operational performance, this study refers to research conducted previously by Nabass and Abdallah, (2018) by categorizing operational performance into 4 aspects, namely; quality, cost, delivery, flexibility. Previous research said that TQM allows companies to achieve better operational performance which can be measured in terms of quality, cost, productivity, flexibility, and delivery time (Adem and Virdi, 2019).

CONCEPTUAL FRAMEWORK

Based on the results of research conducted by Sadikoglu and Olcay (2014), establishing top management commitment and leader involvement as the most important factors in effectiveness in TQM practices. The success of TQM implementation lies largely in the support obtained from senior management in the organization (Purbowo and Waluyowati, 2022). Top management also needs to ensure that quality training is available for human resources in the company (Faeq et al., 2021). Based on previous studies, the following hypothesis was proposed. H1: Top Management Support has a positive and significant effect on Operational Performance.

Several studies have found that customer focus has a positive and significant effect on operational performance (Chauke et al., 2019). Customer focus can see the extent to which a company can meet customer needs and expectations, and find out whether these needs and expectations are met (Faeq et al., 2021). Based on previous studies, the following hypothesis was proposed. H2: Customer focus has a positive and significant effect on operational performance.

Adem and Virdi (2019) said that the key to operational performance in the company lies in the elements of human resource management which include employee engagement, empowerment, training and information sharing. Research conducted by Chauke et al. (2019) also found a significant and positive relationship between employee engagement and operational performance. Based on previous studies, the following hypothesis was proposed. H3: Employee empowerment and engagement have a positive and significant effect on operational performance.

Several studies have also recognized the significant and positive relationship that supplier quality management has with operational performance (Chauke et al, 2019). Based on previous studies, the following hypothesis was proposed. H4: Supplier quality management has a positive and significant effect on operational performance.

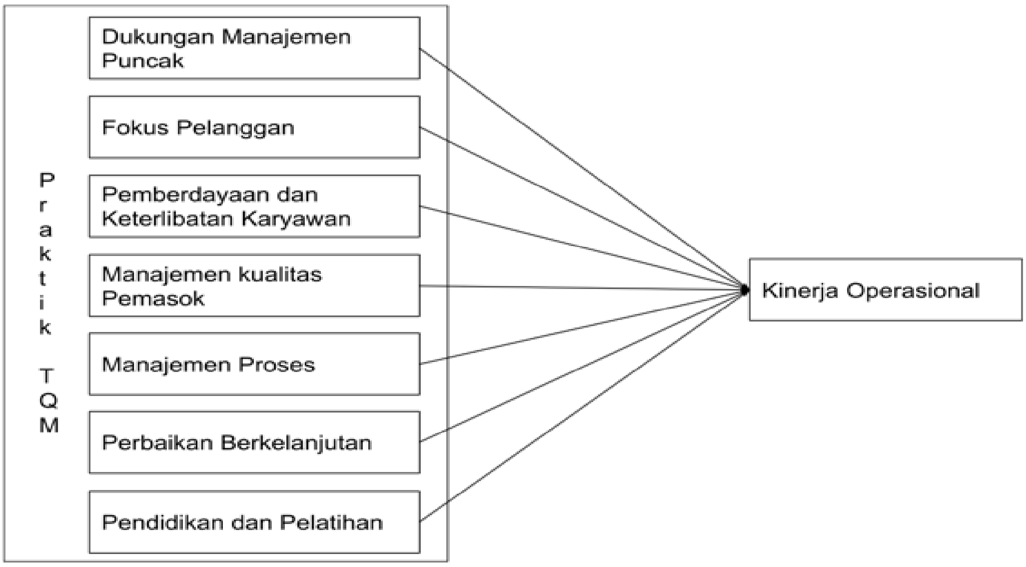

Figure 1. Conceptual Design

Results Research conducted by Chauke et al., (2019) said that process management affects operational performance. Process management plays an important role in improving the efficiency, effectiveness, and flexibility of operations, as well as the quality of the final product (Nasution and Absah, 2022). Process management helps achieve quality improvement by adopting proactive and preventive mechanisms that ensure that production and operational processes with large quantities without errors or potential errors (Purbowo and Waluyowati, 2022). Based on previous studies, the following hypothesis was proposed. H5: Process management has a positive and significant effect on operational performance.

Kiprotich et al. (2018) argues that continuous improvement significantly affects every indicator of a company's operational performance and thus increases the company's competitiveness. Based on previous studies, the following hypothesis was proposed. H6: Continuous improvement has a positive and significant effect on operational performance.

Research conducted by Kiprotich et al. (2018); Demonstrate a significant and positive relationship between employee education and training and operational performance. In order to make a transition in improving the quality of products and processes, companies need human resources, commitment from management, and employee training to be able to adapt to changes (Niyi Anifowose et al., 2022). Based on previous studies, the following hypothesis was proposed. H7: Education and training have a positive and significant effect on operational performance.

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RESEARCH METHODS

The purpose of research is to test the hypothesis because the researcher wants to prove whether the hypothesis that has been compiled is accepted or rejected. Based on the level of involvement of researchers, this study is a study with minimal involvement, conducted at the energy sector company. The unit of analysis in this study is individual, namely Human Resources in the Company. The data period used cross section.

The population in this study is employees of Energy Sector Companies. Respondents to this questionnaire have criteria, namely employees who have worked for more than 2 years. With a research sample of 305 respondents. Sample selection techniques use certain considerations that are generally tailored to the purpose of the study. The sample selection method in this study is Purposive Sampling on employees who work in the field of Energy. Data collection using surveys in the form of questionnaires by sending *internet links*.

Researchers use Primary Data obtained directly from original sources which are then processed and presented by researchers. The data collection instrument is using questionnaires using online surveys by sending internet links. Questionnaire is an information collection technique that will be analyzed to study the attitudes, behaviors, and characteristics of several people in the company who can be affected by the existing system.

The statistical analysis tool used in this study uses SEM analysis processed through AMOS 26 software with the aim of seeing the relationship structure of a number of variables or knowing the arrangement of all variables studied. Based on validity and reliability tests on research instruments, it shows that all research variables are valid and reliable.

RESULT AND DISCUSSION

Test Instruments

The feasibility of data on test instruments is measured using validity and reliability. Validity tests are used to see if indicators are appropriate for measuring variables, and reliability tests are used to analyze whether there is consistency of intervals between indicators (Sekaran &; Bougie, 2016)

Validity Test

Validity test is the test of the extent to which variables in a study can be measured by statement indicators. The analytical tool used in the validity test is Confirmatory Factor Analysis (CFA) by looking at the loading factor in the Structural Equation Model (SEM) and the help of AMOS software. The level of the number of samples will affect the value of the loading factor.(Hair et al., 2019)

Based on the number of respondents in this study is 317 respondents, the loading factor used is 0.40 so that the indicator can be declared valid. The following provisions are based on the loading factor in the table above: If the Loading Factor ≥ 0.40, then the statement item is valid; If the Loading Factor ≤ 0.40, then the item declaration is invalid.

Table 1. Normality Test Results

Kurtosis	Critical Ratio skewness value
121,211	34,71

Source: Authors

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Evaluation of data normality based on *critical ratio skewness value* criteria of ±2.58. While the *multivariate* normality test in this study showed a *critical ratio* value of 34.71, it can be concluded that the data in this study has not been normally distributed. This research uses *the Structural Equation Model* (SEM) analysis method using AMOS software. Before hypothesis analysis is carried out, it is necessary to evaluate the suitability of the model in research to ensure that the model can draw cause and effect. If one of the *goodness-of-fit* criteria has been met, it can be declared a viable model for use in future tests.

Table 2. Goodness of fit results

Goodness of fit index	Criteria (cut-off value)	Calculation Results	Conclusion
X^2 - Chi-square	Expected small (0-2)	5,319	Poor Fit
Significance probability	≥ 0.05	0,000	Poor Fit
RMSEA	≤ 0.08	0,117	Poor Fit
NFI	≥ 0.90	0,913	Goodness Of Fit
RFI	≥ 0.90	0,886	Marginal Fit
TLI	≥ 0.90	0,905	Goodness Of Fit
CFI	≥ 0.90	0,928	Goodness Of Fit
GFI	≥ 0.90	0,793	Poor Fit
AGFI	GFI ≤	0,701	Poor Fit

Source: Authors

These results show that the model used is acceptable because it shows the results of the goodness of fit test, it can be seen that the NFI, TLI, and CFI values are expressed *Goodness of fit*. Results from RFI are declared *Marginal* fit, while results from sig, RMSEA, GFI, and AGFI values are declared *Poor of fit*.

Based on the results above, it can be concluded that the model used in this study can meet the criteria of the model of fit. If one of the goodness of fit criteria has been met, then the model used can be accepted and the next test can be carried out, namely hypothesis testing, because there are 3 measurement models with *goodness of fit* values.

In this study there are 7 (seven) hypotheses that refer to previous research. Hypothesis testing aims to answer the problems posed in research by rejecting the null hypothesis (H0) so that the alternative hypothesis (Ha) can be accepted. The following is a table 3 of hypothesis test results.

Table 3. Hypothesis Testing Results

Hypothesis	Estimate	P-value	Conclusion
H1	-0,140	0,383	Rejected
H2	0,024	0,885	Rejected
H3	0,031	0,937	Rejected
H4	0,302	0,032	Rejected
H5	0,428	0,005	Accepted
H6	0,176	0,533	Rejected
H7	0,313	0,059	Rejected

Source: Authors

The results show that process management and supplier quality management have a positive and significant effect on operational performance because it has a *p-value* of ≤ 0.50, so the hypothesis is accepted. Results were not significant on top management support, customer focus, employee empowerment and engagement, continuous improvement, education and training on operational performance because it had a *p-value* of ≥ 0.05 so the hypothesis was rejected. These results are in line with previous results conducted by Sadikoglu &; Olcay, (2014), Kebede Adem &; Virdi, (2021), where not all TQM practices have significant results on operational performance.

DISCUSSION

H1: Top Management Support for Operational Performance**.** The *p-value* result of 0.383 value is ≥ 0.05, it shows that top management support does not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous research conducted by Sadikoglu &; Olcay, (2014), Kebede Adem &; Virdi, (2021) also found that there was no significant effect on top management support on operational performance. H2: Process Management of Operational Performance. The *p-value* result of 0.005 is ≤ 0.05, it shows that process management has a significant effect on operational performance, so the hypothesis is accepted. This shows that the higher the process management, the higher the operational work. The results of this study are in accordance with the results of previous research conducted by Sadikoglu &; Olcay, (2014), Kebede Adem &; Virdi, (2021). H3: Supplier Quality Management of Operational Performance. The *p-value* result of 0.032 value is below ≥ 0.05, It shows that quality management does not have a significant effect on operational performance, so the hypothesis is rejected. H4: Customer Focus on Operational Performance. The *p-value* result of 0.885 value is ≥ 0.05, it shows that customer focus does not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance. H5: Employee Empowerment and Involvement in Operational Performance**.** The *p-value* result of 0.937 value is ≥ 0.05, it shows that employee empowerment and involvement in operational performance then the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance. H6: Continuous Improvement of Operational Performance. The *p-value* result of 0.533 value is ≥ 0.05, it shows that continuous improvement does not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance. H7: Education and Training on Operational Performance. The *p-value* result of 0.059 value is ≥ 0.05, it shows that education and training do not have a significant effect on operational performance, so the hypothesis is not accepted / rejected. The results of previous studies also found that there was no significant effect on top management support on operational performance.

CONCLUSION

This study analyzes the effect of TQM practices on Operational Performance in energy sector companies using Structural Equation Modeling (SEM) using the help of AMOS software. Based on the results and discussion of research obtained from 317 respondents who are employees in the energy sector. The majority of respondents are male, the majority are aged 20-30 years, the majority of company employees are

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undergraduate graduates, the majority of employees working in the company are over 9 years. Based on the results of hypothesis testing, there is 1 supported hypothesis and 6 unsupported hypotheses showing that not all TQM practices have a significant effect on operational performance. The results of hypothesis testing can be seen: 1) There is no positive effect of Top Management Support on Operational Performance; 2) There is no positive influence Customer focus on Operational Performance; 3) There is no positive influence of employee empowerment and engagement on Operational Performance; 4) There is no positive influence of supplier quality management on operational performance; 5) There is a positive influence of Process Management on Operational Performance; 6) There is no positive effect of continuous improvement on operational performance; and 7) There is no positive effect of Education and training on Operational Performance.

IMPLICATION

This study found that process management has a significant effect on operational performance. These results are associated with key practices such as achieving process capabilities that meet production requirements, maintenance of production equipment according to maintenance plans, conducting regular assessments of production processes and prioritizing quality in developing new products. In short, controlling the production process periodically and monitoring quality data continuously will certainly help the organization to achieve better performance results in terms of operational criteria.

The findings in this study can help managers of energy sector in Indonesia to be able to understand the importance of supplier quality management for operational excellence. In addition, the fact that all TQM practices correlate with operational performance can assist managers in realizing important improvements. The increase is triggered by the relationship between TQM factors. In general, the results of this study will encourage managers of energy sector companies in Indonesia who seek to take advantage of the TQM approach.

LIMITATIONS

In conducting this study, researchers have several limitations, including the research data was spread abnormally due to the presence of outliners and the object of research is only focused on 1 (one) company.

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Transformational Leadership, Perceived Organizational Support, Job Satisfaction Towards Organizational Commitment

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Abstract−Organizational commitment is an important factor for an organization's success in achieving its goals. Therefore, having highly committed employees is the expectation of every organization. Understanding the aspects to increase employees' commitment especially from Gen Z, will help management in making policies and decisions to improve its performance. The purpose of this study is to analyze the influence of transformational leadership, perceived organizational support, and job satisfaction towards employees' organizational commitment in a growth and developmental clinic. Quantitative method was used in this study with an online questionnaire as the research instrument. The subjects of this study are 32 clinic employees from 3 branches. PLS-SEM with Smart PLS 4.8.5 program was used for data processing. The results of this study show that transformational leadership has a positive effect on job satisfaction, transformational leadership has a positive effect on organizational commitment, perceived organizational support has a positive effect on job satisfaction, perceived organizational support has a positive effect on organizational commitment, and job satisfaction has a positive effect on organizational commitment.
Keywords: *Transformational leadership, job satisfaction, perceived organizational support, organizational commitment; gen Z*

INTRODUCTION

Employee turnover is inevitable problem in every organization. However, this problem must be viewed from a new perspective as Generation Z (Gen Z) enters the workforce. A survey conducted by Adobe reported that more than half of Gen Z respondents planned to find a new job in the following year (Josephson, 2022). Gen Z is a generation born between 1995 and 2009 (McCrindle, 2014), also known as a population that likes to change jobs (Padey, 2022) with a three times greater tendency to change jobs (Heittman, 2018). Turnover negatively affects work performance as well as quality of the organization to achieve its vision and mission (Greenberg, 2011).

Therefore, employees' organizational commitment is an important factor that determines the success or failure of the organization (Hadi & Tentama, 2020). This commitment reflects the extent to which the employee identifies himself with an organization and is committed to its goals (Kreitner & Kinicki, 2010). Moreover, employees who are committed to the organization have higher level of involvement in carrying out the values and goals of the organization (Claudia, 2018). Therefore, having committed employees will result in better organization performance to achieve its goals.

The results of empirical studies also show a negative correlation of organizational commitment to turnover intention (Hariyonyoto, Musnadi, & Majid, 2019), (Nathisa M. & Noer, 2018) and a positive influence on employee retention (Putra, Kusnanto, & Yuwono, 2020). Understanding the aspects that can increase employee organizational commitment will be helpful, especially for organizations with majority Gen Z as their employees in making policies and decisions for improving organizational performance.

Leadership qualities in an organization are a significant factor in the successfulness of its human resources management (Njoroge, 2015). Transformational leaders motivate, boost creativity and new ideas, inspire their followers to think and act beyond their personal interests, mentor to develop followers' potential and to achieve greater common goals. Employees who experience these traits from their leaders will also develop higher satisfaction for their work (Puni, Mohammed and Asamoah 2018), (Kouni, Koutsoukos and Panta 2018). Results from previous studies show that transformational leadership is a leadership style that is able to increase organizational commitment (Almaududi Ausat et al., 2022); (Pratama, Sunaryo, & Yusnita, 2020); (Silitonga et al., n.d.). In addition to that, the result of McGaha, K.K. (2018) study to 18-22 years old subjects shows that transformational leadership style is their preferrable leadership style.

Employees who have positive perception of organizational support for their work and well-being feel valued (Rhoades, Eisenberger, & Armeli, 2001) and have higher work commitment to the organization (Colquitt, Lepine, & Wesson, 2015). It is also supported by the result of previous study by Claudia (2018) that stated positive perception of the organizational support gives employees a sense of satisfaction towards the work, which in turn contributes to a high commitment to the organization. Furthermore, employees who are satisfied with their work and have positive feelings when doing the work, will give good performance and loyalty to the organization (Colquitt, Lepine, & Wesson, 2015).

Many studies have been conducted to look at the relationships and influences of transformational leadership, perceived organizational support and job satisfaction separately towards organizational commitment. But not many research explores the relation and effect from these three variables toward organizational commitment. In addition to that, not many quantitative research conducted specifically on organizations with the majority of Gen Z employees. Therefore, this study is expected to understand more extensively the effect of transformational leadership, perceived organizational support, and job satisfaction towards organizational commitment of Gen Z employees.

LITERATURE REVIEW

Organizational Commitment

Organizational commitment is the desire of employees to remain part of the organization (Colquitt, Lepine, & Wesson, 2018), which is reflected in how employee identifies himself with the organization and is committed to organization's goals (Kreitner & Kinicki, 2010). This organizational commitment is demonstrated by employees through work attitude and loyalty to the organization as well as support to the vision, mission, and goals of the organization. (Hidayah and Tobing 2018, 123).

Meyer dan Allen (1991) formulate three components in organizational commitment: affective commitment, continuance commitment, and normative commitment. Hadi dan Tentama (2020) describes that affective commitment is indicated by the emotional bond and sense of responsibility of employees for the organization success, behavioral indicators seen in employees include: employee identification to organizational activities, desire to stay with the organization, sense of belonging to the organization, willingness to sacrifice, and responsibility for the organization.

The continuance commitment component is a commitment based on consideration of the costs and benefits obtained if leaving or staying with the organization (Meyer and Allen 1997). And the third commitment is normative commitment which is based on moral obligation to serve the organization (Purwanto, et al. 2021).

Transformational Leadership

Transformational leadership develops from transactional leadership (Bass and Riggio 2005). Relationship between leaders and followers is not transactional only, that is based on the conditions that must be accomplished and the rewards that will be given. In transformational leadership a leader is: (1) inspiring people he leads by demonstrating the importance of the value of the goals to be achieved, as well as how to achieve them; (2) allow followers to transcend self-interest for the sake of a group or organization; (3) increase the level of needs of followers in the hierarchy of needs from a lower level of safety and security to a higher level of self-actualization (Bass and Ruth 2008).

There are four components of transformational leader characteristics according to Bass and Riggio (2005): 1) Idealized Influence: The leader is a role model for his followers. The leader is respected and trusted by his followers. Moreover, leaders must be able to emphasize the importance of having a sense of community to achieve organizational goals, daring to take risks, being reliable and consistent in carrying out their obligations; 2) Inspirational Motivation: The leader motivates and inspires by giving meaning to work, gives challenges, maintains team spirit, enthusiastic, optimistic and communicates goals and visions clearly; 3) Intellectual Stimulation: The leader seeks innovative and creative behaviors from followers and encourages new approaches and ideas without criticizing followers for the diversity and difference of ideas; and 4) Individualized Consideration: The leader pays attention and knows each individual he leads, delegates tasks, gives input, acts as a mentor to develop the potential of his followers.

Trust, loyalty, and respect from the followers, enable a transformational leader to encourage the person he leads to work better and even exceed the expectations given (Purwanto, et al. 2021). Transformational leaders increase awareness in the person they lead about the importance of the results to be achieved and also increase confidence in their ability to achieve those goals (Colquitt, Lepine, & Wesson, 2018)

Perceived Organizational Support

Eisenberger et al. (2016) defines perceived organizational support (POS) as employees' perception of the organizational support for their work, contributions, and their well-being. Colquit et al. (2018) stated a similar definition of perceived organizational support as the level of confidence of employees in the support and concern of the organization for their contribution and welfare. The confidence in the support of the organization is felt by employees if they get reasonable appreciation, their votes are counted, and they have the support they need to do their job from their superiors (Robbins and Judge 2017).

POS provides benefits not only for employees but also for the organization. Companies invest resources in programs that support POS, for example: Google encourages technician innovation through worktime flexibility where 20% of their time can be used for individual projects, providing onsite physician facilities, spas, swimming pools for free. From the meta-analysis conducted in various studies in 20 years related to organizational commitment, job satisfaction, performance, and intention to leave, it was found that POS has a positive and strong relationship to organizational commitment and job satisfaction. POS also shows a strong and negative relationship to intention to leave (Riggle, Edmondson and Hansen 2009).

POS can be defined as an employee's confidence in an organization's support for performance, quality and competency development, as well as its well-being. The POS indicators in this study are: rewards for performance, supervisor's support, learning and self-development opportunities, and positive work environment.

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Job Satisfaction

Quoting from Wicker (2011), Saleem defines job satisfaction as an employee's sense of pride and inner fulfillment with the achievement of work he or she does (2015). Employees with high job satisfaction will have positive feelings about their work, duties, roles and responsibilities. (Colquitt, Lepine, & Wesson, 2018). Moreover, employees who are valued for their work, will feel satisfied.

Colquitt et al (2018, 101-102) explained the 5 core job characteristics based on job *characteristics theory* that can make the job more satisfying: 1) Variety: a job with different activities that require different skills and talents; 2) Identity: a job with a result of work that reflects the hard work of its creator; 3) Significance: work has a substantial impact on the lives of others, especially to the world; 4) Autonomy: work that gives freedom, independence, and flexibility to the individual who does the work; and 5) Feedback*:* employees get clear information about how well they are doing their job.

Judge dan Klinger (2009) describes the reciprocal relationship between job satisfaction and performance. Employees who are satisfied with their work will be more productive, and good performance will make employees feel satisfied with their work; Especially if you get the right award for your performance. In addition, the consistency of the negative correlation of job satisfaction to absenteeism and turnover. The results of the study also show that a moderate relationship tends to be strong between job satisfaction and life satisfaction (Judge and Klinger 2009, 108), (Bernarto, et al. 2020). Because of the good outcomes for individuals and organizations, job satisfaction is an important aspect to be the concern of organizational management.

Relationship Transformational Leadership and Job Satisfaction

Transformational leadership is a leadership style that inspires a person to think and act beyond his personal interests, to develop his abilities and skills optimally to achieve greater common goals. Thus, the individual will feel satisfaction in the work he does. (Puni, Mohammed and Asamoah 2018), (Kouni, Koutsoukos and Panta 2018). Therefore, the proposed hypothesis is:

H1: Transformational leadership positively affects job satisfaction

Relationship Transformational Leadership and Organizational Commitment

Transformational leadership is leadership style that is able to influence and inspire employees to go beyond their personal interests (Pratama, Sunaryo and Yusnita 2020), to use and develop their abilities and skills optimally for the achievement of greater common goals (Ausat, et al. 2022) and earned internal awards (Gibson, et al. 2006). Organizational commitment is the desire from within employees to remain part of the organization because the trust in the organization's goals, vision, and mission as well as an emotional bond to the organization. Thus, transformational leadership characteristics will produce employees with character and commitment to the organization. Therefore, the proposed hypothesis is:

H2: Transformational leadership positively affects organizational commitment

Relationship Perceived Organizational Support and Job Satisfaction

In POS there are elements of fairness, appreciation, attention to the lives of employees and There is also consideration of what the employee's goals and values are recognized (Eisenberger, Huntington, et al. 1986). With the consideration of job satisfaction is a form of employee emotional feelings as a reflection of their work,

performance, and work experience, the higher the employee's perception of organizational support will affect the level of employee satisfaction with their work. Therefore, the proposed hypothesis is:
H3: Perceived organizational support positively affects job satisfaction

Relationship Perceived Organizational Support and Organizational Commitment

Employees who have good support from their organization, will feel responsible for replying to the organization (Claudia 2018). Organizational commitment is an employee's emotional feelings that reflect his attachment to the organization. These employee-perceived bonds will increase their commitment to the organization (Eisenberger, Stinglhamber, et al. 2002). From study by Rhoades eta al, (2001, 825) the result shows that employees who feel supported by the organization will have meaningful feeling in themselves. This in turn will increase employee's work commitment. Based on this relationship, the hypothesis proposed is:
H4: Perceived organizational support positively affects organizational commitment.

Relationship Job Satisfaction and Organizational Commitment

An employee who is satisfied with his work will show a positive attitude and behavior towards the organization in the form of greater commitment than dissatisfied employees (Claudia 2018). This positive attitude of employees is shown through affective commitment to the organization with indicators including: a sense of belonging, willing to sacrifice, and responsibility to the organization. Satisfaction with work arising from the support of the organization will foster a feeling of bond to contribute to the organization. This is an indicator of normative commitment. Furthermore, the satisfaction of the award for work and other benefits provided by the organization causes the employee to try to maintain the award that he has obtained or will get later as an appreciation for his performance (Ismail 2016). This is an indicator of continuance commitment. Thus, the satisfaction felt by employees from awards, supervisory support, feedback on their performance, and the meaning of their work will affect their work commitment. Therefore, the proposed hypothesis is:
H5: Job satisfaction positively affects organizational commitment

METHODOLOGY

Based on the theoretical references, background problems, and some previous studies, the research model is presented in figure 1. From the research model above, transformational leadership and perceived organizational support are the exogenous variables. Organizational commitment is the endogenous variable and job satisfaction is both exogenous and endogenous variable. This research was conducted with a quantitative approach. According to Sugiyono (2018), quantitative approach is used to study a population or a sample of population and statistical analysis will be done to the data collected from the research instrument to test the proposed hypothesis. The data in this research was collected using a g-form questionnaire that was sent to all employees of a growth and development clinic. The clinic has 3 branches located in Jakarta, Tangerang and Medan.

The questionnaire has 52 items closed statements to measure transformational leadership, perceived organizational support, job satisfaction, and organizational commitment variables. The questionnaire consists of 12 items to measure 3 components of organizational commitment: affective commitment, normative commitment and

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continuance commitment. The statements used are adapted from organizational commitment scales (Allen and Meyer 1990). The example of statement used to measure affective commitment is: “Clinic’s problem is also my problem”; an example of statement used to measure normative commitment is: “I stay with the clinic because I need to”; and an example of statement used to measure continuance commitment is: “Loyalty is important. Therefore, I have to stay with this clinic”.

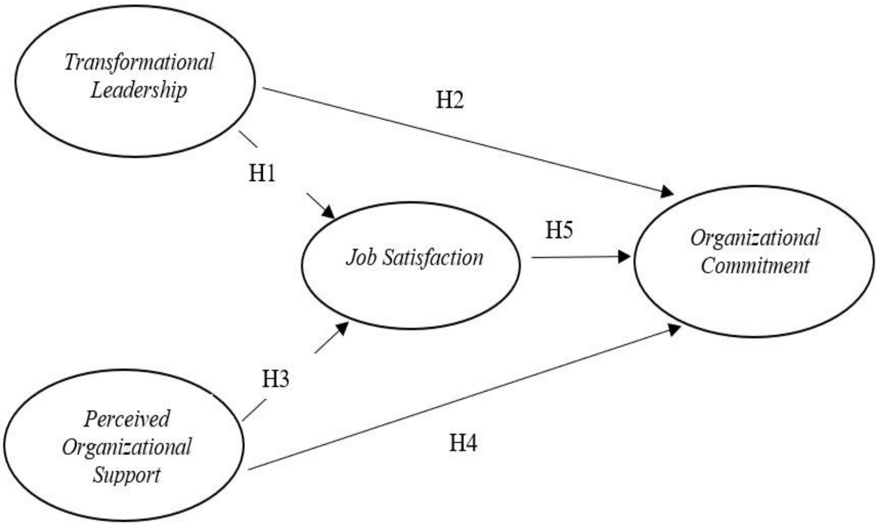

Figure 1. Research Model
Source: Authors

Moreover, the questionnaire consists of 12 items closed statements to measure transformational leadership characteristics are adapted from Multifactor Leadership Questionnaire (MLQ) (Bass and Riggio 2005). The indicators measured are: (1) leader as the role model, (2) leadership that motivates, (3) leadership that encourages creativity and new ideas, and (4) leader as mentor for potential development. There are 12 items to measure perceived organizational support variable. The indicators measured are: (1) reward for good performance, (2) supervisor support, (3) opportunity for learning and self-development, and (4) positive working environment. These items are adapted from Survey of Perceived Organizational Support (SPOS) (Eisenberger, Huntington, et al. 1986).

Lastly for job satisfaction variable, there are 16 items of closed statements used to measure aspects: reward received from work, positive feelings towards co-workers, positive feelings toward a supportive working environment, and positive feeling from a meaningful job. These statements are adapted from Job Satisfaction Survey (JSS) (Spector 1985). Each item is measured using 5 Likert scales with the following scores 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, 1 for strongly disagree.

This research was conducted to all employee in a growth and developmental clinic that has 3 branches with total of 32 employees. Therefore, the sampling technique used is census technique, where the entire population is a research sample. The questionnaire was sent in mid-October 2022, responses were returned 100% and all data was collected in mid-November 2022. There are 3 parts in data analysis technique: descriptive statistics,

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inferential statistics with Path Least Squares-Structural Equation Modeling (PLS-SEM) using Smart PLS 4.8.5 program, and hypotheses test.

RESULT AND DISCUSSION

Descriptive Statistics

Data collected in table 1 shows that 88% of employees' age is below 29 and 75% are single. This explains that majority of the clinic's employee is categorized from Gen Z and singles. Employees who have worked for more than 3 years are 13%. This data shows that the clinic has limited senior employees. 78% of the employees are already permanent staff who entitles to receive benefits provided for staff.

Moreover, the descriptive statistics of organizational commitment variable concludes that the clinic employees' commitment majority is cost-based (continuance) and normative commitment. Clinic management is recommended to improve aspects of affective commitment of its employees. In addition to that, management needs to pay attention on employees' neutral responses about changing jobs is an ethical decision to make. It shows that even though employees are still believing in the value of loyalty, but majority of them are Gen Z, who see changing jobs as an ethical action to make and it even gives advantage to their work profile.

Table 1. Summary of Demographic Data

No.	Characteristic		Number of Respondents	Percentage	Total
1.	Age	< 25	16	50%	32 (100%)
		25-29	12	38%	
		30-39	2	6%	
		>39	2	6%	
2.	Marital Status	Married	8	25%	32 (100%)
		Single	24	75%	
3.	Working Time	< 1 year	13	41%	32 (100%)
		1-2 years	15	47%	
		> 3 years	4	13%	
4.	Employment Status	Permanent	25	78%	32 (100%)
		Contract	6	19%	
		Part Time	1	3%	
5.	Educational Background	High School	7	22%	32 (100%)
		D3	6	19%	
		D4	7	22%	
		S1	11	34%	
		S2	1	3%	

Source: Authors

Measurement model tests are carried out to check the validity and reliability of indicators of each research variable. The tests carried out include: convergent validity, discriminant validity, and reliability.

Convergent Validity

Convergent validity test aims to check the relationship validity between the indicator and the construct it measures. Convergent validity is assessed based on Average Variance Extracted (AVE) and outer loading. According to Ghozali dan Latan (2015, 74) AVE value must be greater than 0.5 to prove the validity. Table 4.2 shows AVE values above 0.5 for all four variables explaining that all variables qualify for convergent validity tests.

Table 2. Average Variance Extracted (AVE)

Variables	AVE
Transformational Leadership	0.714
Perceived Organizational Support	0.785
Job Satisfaction	0.720
Organizational Commitment	0.626

Source: Authors

Discriminant Validity

Discriminant validity tests are carried out to ensure that the concept of each latent variable is different from the other variables. The discriminant validity test was assessed with fornell-larcker criterion. The results in table 3 show that the AVE square root of each variable is higher compared to the correlation value of the variable with other latent variables. Thus, this research model is accepted.

Table 3. Discriminant Validity Fornell-Larcker

	JS	OC	POS	TL
JS	0.849			
OC	0.724	0.791		
POS	0.679	0.692	0.886	
TL	0.768	0.716	0.594	0.845

Source: Authors

Reliability

Composite reliability test is used to measure internal consistency of latent variables. According to the standard rules, composite reliability value must be above 0.7 to have good reliability. Based on the results in table 4, the composite reliability value of all variables is above 0.7. It means this research has satisfactory internal consistency.

Table 4. Reliability Test Result

Variable	Composite Reliability
Transformational Leadership	0.937
Perceived Organizational Support	0.962
Job Satisfaction	0.947
Organizational Commitment	0.921

Source: Authors

In testing structural models or inner models, the first step is to examine the collinearity issues by calculating the value of variance inflation factor (VIF). When there's no collinearity issues found the second step is to evaluate the significance and relevance of the structural model with path coefficients, and the last step is to assess the model's explanatory power through coefficient of determination (R^2) (Hair Jr., et al. 2021).

Collinearity Assessment

This multicollinearity test is performed by calculating the value of VIF. The VIF values above 5 are indicative of probable collinearity issues (Hair Jr., et al., 2021),

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therefore the VIF values are ideally close to 3 and lower (Hair, Risher, Sarstedt, & Ringle, 2019). From the result at table 5, the entire VIF values are below 3. This shows that there is no problem of multicollinearity in latent variables in this study.

Table 5. Variance Inflation Factor (VIF) Values

Variable	VIF	
	JS	**OC**
Job Satisfaction		2.995
Transformational Leadership	1.545	1.902
Perceived Organizational Support	1.545	2.493

Source: Authors

Coefficient of Determination (R^2)

The coefficient of determination or R-square (R^2) is used to measure the suitability of the research model in explaining endogenous variables (Hair, et al. 2019). Based on result on table 6, the value of R^2 for job satisfaction is 0.666 which explains that 66.6% of employees' job satisfaction is influenced by transformational leadership and perceived organizational support variables. And 33.4% of them is influenced by other variables that were not tested in this study. Thus, transformational leadership and perceived organizational support are moderate variables to job satisfaction.

Moreover, the value of R^2 for organizational commitment is 0.643. It explains that 64.3% of employees' commitment is influenced by transformational leadership, perceived organizational support and job satisfaction. And 35.7% of them is influenced by other variables that are not tested in this study. These results show that transformational leadership, perceived organizational support and job satisfaction are variables with moderate power in explaining organizational commitment variable.

Table 6. R^2 Value

Variable	R^2
Job Satisfaction	0.666
Organizational Commitment	0.643

Source: Authors

Hypothesis Test

Hypothesis test was carried out to see the relationship between latent variables in this study. The path coefficient is a value that shows the relationship between variables in research with a range of values between -1 and +1 (Hair, et al. 2019, 13). Table 7 presents the results of the path coefficient from the analysis of research data.

The results of the path coefficient test between exogenous variables: transformational leadership, perceived organizational support, job satisfaction with endogenous variables: organizational commitment showed positive values. Therefore, it can be concluded that organizational commitment is positively influenced by transformational leadership, perceived organizational support, and job satisfaction. This result also shows that job satisfaction is positively influenced by transformational leadership and perceived organizational support. Furthermore, the value of indirect influence that serves to explain the effect of exogenous variables on endogenous variable through variable mediator is also positive. The value of the indirect influence can be seen in the table 7.

The Variance Accounted For (VAF) value is calculated to see the influence of variable mediator: job satisfaction that mediates the effect of transformational leadership and perceived organizational support on organizational commitment. The VAF value is obtained by comparing the value of the indirect influence with the value of its total influence. Table 8 below presents the VAF values.

Table 7. Indirect Influence

Path	Indirect Influence
$T \rightarrow JS \rightarrow OC$	0.139
$POS \rightarrow JS \rightarrow OC$	0.085

Source: Authors

Table 8. Variance Accounted For (VAF)

Mediation	Indirect Influence	Direct Influence	Total Influence	VAF
TL – JS	0.139	0.333	0.472	0.295
POS – JS	0.085	0.326	0.411	0.207

Source: Authors

From the VAF value in table 8 above, it can be explained that job satisfaction in mediating transformational leadership and organizational commitment value is 0.295 or 29.5%. This value shows that job satisfaction has partial mediating effect. Furthermore, job satisfaction as a mediator variable between perceived organizational support and organizational commitment is 0.207 or 20.7%. This value also shows that job satisfaction has partial mediating effect. This result means that without job satisfaction as mediator variable, transformational leadership and perceived organizational support variables have effect directly to organizational commitment.

The results of the hypothesis test of this study are presented in table 9 below. All values are positive and higher than null; therefore, all hypotheses are accepted.

Table 9. Hypotheses Test Result

Hypothesis	Path Coefficient	Result
H1: $TL \rightarrow JS$	0.563	Accepted
H2: $TL \rightarrow OC$	0.333	Accepted
H3: $POS \rightarrow JS$	0.345	Accepted
H4: $POS \rightarrow OC$	0.326	Accepted
H5: $JS \rightarrow OC$	0.246	Accepted

Source: Authors

CONCLUSION

From the test results above, they all conclude the acceptance of hypothesis 1 that transformational leadership has positive effect on job satisfaction, which is supported by the positive result of the path coefficient = 0.563. This result is in accordance with previous studies conducted by Chandrasekara (2019) and Choi, et al. (2016). It explains that the implementation of transformational leadership at clinic has an influence to increase employees' satisfaction towards their work.

The results also conclude the acceptance of hypothesis 2 that transformational leadership has positive effect on organizational commitment which is supported by positive result of path coefficient = 0.333. This result corresponds to previous studies conducted by Silitonga, et al. (2020) dan Ausat, et al. (2022). It explains that the implementation of transformational leadership at the clinic will increase employees' organizational commitment.

The results also conclude the acceptance of hypothesis 3, that perceived organizational support has positive effect on job satisfaction. These results are in accordance with previous research conducted by Bernanto, et al. (2020) and Claudia (2018) which explains that employees who have a positive perception of organizational support will increase employee satisfaction at their work.

Moreover, the results also conclude the acceptance of hypothesis 4 that perceived organizational support has positive effect on organizational commitment. These results are in line with previous studies showing positive influences and moderate effects of perceived organizational support towards organizational commitment (Aban, Perez, Ricarte, & Chiu, 2019).

Lastly, the test results conclude the acceptance of hypothesis 5 that job satisfaction has positive effect on organizational commitment. The results obtained are in accordance with previous research conducted by Gopinath (2020). With this result, it shows that the more satisfied the employees, the higher their commitment to the organization.

Results in this research also show the effect of job satisfaction as mediator variable. Job satisfaction has partial mediating effects in the relation between transformational leadership and organizational commitment and also in the relation between perceived organizational support and organizational commitment.

There are several limitations in this research that need to be improved are: the methodology and technical procedures in holding the research. The number of items in the questionnaires can be reduced to avoid staff boredom and maintain concentration in responding to the statements. Moreover, the limited number of subjects from 3 branches was the main obstacle to use only the Gen Z employees as research subjects.

The results from this research explain that transformational leadership, positive organizational support, and satisfaction towards work influence the employees' commitment. In addition to that, with better understanding about the traits and behaviors of Gen Z employees, the clinic leaders and management are able to support its employees with effective policies and create working environment that would get the best out of its employees. It is very important for management to be able to manage different generations in its workforce to integrate, work together and then successfully achieve the mutual goals.

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Process Analysis of Business Incubators in Creating Product Innovation at PT Telkom Indonesia (Persero) Tbk (Case Of Digital Amoeba)

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Abstract-Business incubators are developing in Indonesia, especially the incubator business under the company auspice. This incubator program functions as an innovation laboratory that aims to find new hidden talents within employees. Indeed, business incubators face various challenges such as human resources, capital, technical validation, regulation, and market potential as well as aligning products produced with the goals of the main company. This study aims to further identify the incubation process and evaluate the challenges that hinder startups to survive after passing the incubator process. The evaluation covered the pre-incubation stage, the core incubation stage, and the post-incubation stage. These components were analyzed to see the learning process in the incubator. This study used qualitative methods and data were collected through in-depth interviews. Besides, it used secondary data. The results of this study are expected to be a learning evaluation tool in the incubator and guidelines in incubation management in the future. Besides, this study is also expected to stimulate the incubator to continue developing.

Keywords: *business incubator, company business incubator, incubation process, intrapreneur, innovation laboratory*

INTRODUCTION

PT Telkom Indonesia (Persero) Tbk (Telkom) is a State-Owned Enterprise (SOE) engaged in information and communication technology (ICT) services and telecommunications networks in Indonesia. Telkom's majority shareholder is the Government of the Republic of Indonesia at 52.09% while the remaining 47.91% is controlled by the public. Telkom's shares are traded on the Indonesia Stock Exchange (IDX) under the code "TLKM" and the New York Stock Exchange (NYSE) under the code "TLK".

TelkomGroup has a special division that plays a role in the implementation of business activities, namely, the Digital Service Division (DDS) by focusing on product scouping development, especially digital product innovation through coherence innovation, discovery, incubation & acceleration (DIA) process, research, standardization & quality assurance (RSQA) process, and big data analytics. The Digital Service Division (DDS) oversees several areas such as General Affairs, Business Development & Performance, Digital Marketing and Amoeba Management.

Digital Amoeba was established in 2017, as part of the Digital Service Division (DDS) of PT Telkom Indonesia. Digital Amoeba is positioned as a company innovation laboratory in which there is an incubator program for ideas owned by its employees in creating digital talent and digital businesses. These talents and digital businesses are created with the aim of contributing to the digital economy in Indonesia. Digital Amoeba is a disruptive form of human resources, digital services, and budgeting & finance teams. Participants of the Digital Amoeba program are called Amoeba's, while the team managing the Digital Amoeba is called Amoeba Management (AMA). This program is expected to produce startups that can produce the latest innovations for Telkom Indonesia. The innovation focuses on new products and services as well as business operations.

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Startups play a key role in the innovation process (Colombo and Piva, 2008; Davila et al., 2003; Mustar et al., 2008). Forming relationships with external partners becomes a priority for startups to achieve success (Teece, 2010; Pangarkar and Wu, 2012; Kask and Linton, 2013).

After running for 1 year, the Digital Amoeba program has produced around 7 batches with a total of 60 Amoeba's teams that have been initiated. Seeing this opportunity and also to make Digital Amoeba more aggressive in achieving its goals, Digital Amoeba improved its system and way of working. The new system and way of working is called Digital Amoeba 2.0. The change brought a new impact on Amoeba's management by creating four teams under its auspices, named Amoeba Incubator, Amoeba Accelerator, Amoeba Caeros, and Amoeba Bushido.

Amoeba Incubator is a team whose main job is to gather people and ideas to strengthen the team and become the basis for product/service development. Next, Amoeba Acclerator is a team whose main job is to select the best form of incubator for Digital Amoeba that has a good projection to scale their market and prepare the team to go to commercialization stage at least in MV (Market Validation) phase. The next team, Amoeba Caeros, is a small team in Amoeba Management (AMA) that manages and builds engagement between Amoeba's, AMA and external parties (partners, networks or customers). The last team, Amoeba Bushido, is the team that builds, controls, and manages Amoeba's Digital strategy, finance, and digitalization. Amoeba's can discuss policies, partnerships, and other administrative support.

The target market for the output produced by tenants from Digital Amoeba is clearer, namely entering the Telkom Group market. Many Digital Amoeba products are directly used by the Telkom Group. One of the Co-Founders of the incubation tenants, namely Indigo Creative Nation, states that the difference between Digital Amoeba and Indigo is that if a startup initiated by Digital Amoeba fails, the team can return to become employees of Telkom Indonesia, whereas if a startup initiated by Indigo fails, they cannot return to Telkom Indonesia as initially, they were not from Telkom.

The same with the general startups that often face problems, Amoeba's faces problems in delivering the right solution to the problems faced by consumers. The CEO of Digital Amoeba explained that not all 60 business start-ups participating in the Digital Amoeba program can survive and succeed. Only 38 teams survive today and 17 startups whose programs are ready to be used by the Telkom Group. Meanwhile, innovation is not just only limited to creating new products or services. A new product or service may only be part of a process, the innovation mainly produces a sustainable business model. A sustainable business model refers to when the company provides appropriate value to customers and values profitably. Without them, a product cannot be considered an innovation (Viki et.al, 2017:4). Startups usually experience a structural shortage of both tangible and intangible resources due to their small scale. Lack of financial and human resources also hinders the development of innovations (Wymer & Regan, 2005).

METHODOLOGY

Based on the Study Objective

As the study is descriptive in nature, the researcher already knows the factors and measurement variables of Digital Amoeba but not the relationship between these measurement variables. There are three variables in this study that are elements of the incubation process, namely selection, service, and output. As for measuring the success

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of business incubators, there are five points that are used as measurement indicators, namely goals/strategies, human resources, services provided, partner/network programs, and incubation period. Detailed information about Digital Amoeba has been obtained by researchers prior to the research. Information was obtained through the website address of Digital Amoeba, namely www.digitalamoeba.id

Based on the Research Paradigm

The paradigm in this research is post-positivsm. Post-positivism is a flow of improvement from the weaknesses in the positivism flow which only relies on the ability of direct observation of the object under study. Post-positivism has an interactive relationship between the researcher and reality because this flow states that it is impossible to achieve or see the truth if the researcher stands behind the scenes without getting involved with the object directly. Therefore, the principle of triangulation is needed (Basuki, 2006). Research begins with setting the problem up with the right questions leading to empirical research (Ghina, 2014). Ghina, Astri. (2014).

Researchers conducted research observations by going directly to the field, namely Bandung Digital Valley (BDV) and Jakarta Digital Valley (JakDiVa) to conduct interviews and build interactive relationships with the intention of getting involved with the object directly. The researcher also tried to be as neutral as possible so that the level of subjectivity could be minimized.

Based on the Approach to Theory Development

The approach used in theory development is deduction / deductive. Deductive theory development begins with abstract concepts or theoretical propositions that describe the logical relationship between research concepts. The next step is to evaluate concepts and propositions against real evidence. Deductive is the transition from ideas, theories, or mental images to observable empirical evidence (Neuman, 2014: 69). Researchers start from a problem and then create a framework from the data obtained in preliminary data gathering. After that, looking for theories related to the incubator process, then collecting data through interviews with parties related to the running of the Digital Amoeba program.

Based on the Research Methodology

This study used a qualitative method with data analysis in the form of descriptions that cannot be quantified directly. Data quantification in the qualitative method is by giving codes or categories. The qualitative study mainly aims to transform the object of the study into a form that can be presented, such as field notes, interview results, recorded conversations, photographs, and memos (Indrawati, 2015: 206).

The researcher used a qualitative method because the researcher wanted to identify the patterns and features that exist in Digital Amoeba. In collecting the data needed for this research, the researcher transformed the object into the form of field notes, interview results and recorded interviews with sources, for further processing or what is called quantification through the verbatim process. With the aim of learning as a whole about the stages that exist in Digital Amoeba.

Based on the Research Strategy

The strategy used in this research is to conduct a survey. Researchers conducted a survey by going directly to the co-working space area of Digital Amoeba, namely

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Bandung Digital Valley to see firsthand how the atmosphere where tenants conduct business activities. In collecting the required data, researchers conducted interviews with CEOs of tenants who participated in Digital Amoeba. Furthermore, from the results of the interview, a conversation analysis is carried out, which generally focuses on the conversation in an interaction that occurs by paying attention to the analysis of the communicative competencies that underlie everyday social activities (Indrawati, 2015: 210).

Based on the Unit of Analysis (Population Studied)

The unit of analysis refers to the level of unity of the data collected for the next stage of data analysis. In this study, the unit of analysis is the organization. Where researchers conducted a comprehensive research on Digital Amoeba. Starting from the selection process carried out to the output produced and its impact on PT Telkom Indonesia.

Based on Researcher Involvement

Based on the involvement, the researcher has a moderate intervention. Where researchers do not have an interest in correlation findings, but want to determine firmly the causal relationship. That is, the researcher wants to show that the results of the innovations created by Digital Amoeba have an influence on the goals of PT Telkom Indonesia in making sustainable innovations.

Based on the Research Setting

The research setting used is Non-Contrived, where research is conducted in a natural environment. Researchers do not have any involvement in the natural activities of research subjects (Indrawati, 2015: 118). In a sense, researchers do not participate in the process of incubation stages at Digital Amoeba, but researchers only observe the activities and stages carried out during the incubation process until completion.

Based on Research Time

Based on the time of implementation, this research was conducted in a Cross-Sectional manner. Where researchers collect data only in one period, then do data processing, analysis and finally draw conclusions to answer research questions. In general, this type of research is summarized in Table 1.

Table 1. Type of Research

NO	Type Of Research	
1	Based on the Study Objective	Descriptive
2	Based on the Research Paradigm	Inter-pretivism
3	Based on the Approach to Theory Development	Deductive
4	Based on the Research Methodology	Qualitative
5	Based on the Research Strategy	Case Study
6	Based on the Unit Of Analisys	Organization
7	Based on Researcher Involvement	Moderate Intervention
8	Based on The Research Setting	Non- Contrived
9	Based on Research Time	Cross-Sectional

Source: Author's Process (2019)

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RESULT AND DISCUSSION

Analysis of Pre-Incubation Stage

Criteria

This attribute explains the predetermined criteria for tenant acceptance. Based on the findings, tenant criteria were ideas, business value, product feasibility, passion, and employees of PT. Telkom Indonesia Tbk has an Employee Identification Number (NIK) as well as a founder from an internal employee of PT. Telkom Indonesia Tbk. The most important criteria applied by the incubator are the founders. The founder has to from Telkom employees who want to create a new product to solve a problem as so far PT. Telkom Indonesia often makes new products but only for assignments or projects and has no sense of ownership. Thus, it looks for the most interested founders. Participants must be volunteers, not assignments as the nature of the assignment is not last long. Therefore, it requires passion or intention from within oneself. Besides, the ideas of the participants are also considered by the judges. The ideas must be clear covering the definition, function, and reasons for creation. The last consideration to accepting the tenant is the availability of the team. The criteria applied by Digital Amoeba can be seen below.

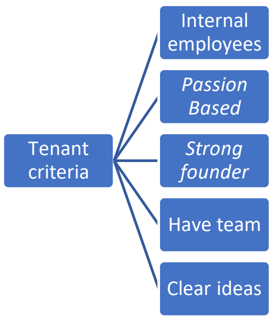

Figure 01. Tenant Criteria of Amoeba Digital Business Incubator
Source: Processed data

Stages

In the pre-incubation process, many stages need to be carried out before the selection. In developing its innovations, Digital Amoeba uses the C-Level Authority scheme in which each Amoeba's has full and independent authorization for the development of its innovations. C-Level Authority consists of the CEO (Chief Executive Officer) as a Hustler who is trusted to lead the board of directors in a business, the CMO (Chief Marketing Officer) as a Hipster whose job is to lead the marketing division and handle business marketing, and CTO (Chief Technology Officer) as a Hacker who is fully responsible for all technology and information activities in the business. Digital Amoeba opens recruitment twice a year. After opening the registration, the participants submitted their ideas through the provided form. The open recruitment process is carried out in each region across 7 regions including Sumatra, Jakarta, West Java, Central Java, East Java, Kalimantan, and Sulawesi. The idea selection process is carried out through a pitching process and the number of participants will be narrowed after going through some stages. After passing the pitching stage, the participants entered the boot camp for 3 months to assess their progress. In 2017-2018, this process was a form of collaboration between the Directorate of Human Capital and the Directorate of Digital Business, but it is only a collaboration with the Directorate of Human Capital now. The form of collaboration is in the process of opening the registration until obtaining the top 20. The process is carried out by the HCM directorate and after that, the incubation process is managed by Digital Amoeba. The pre-incubation stages carried out by Digital Amoeba can be illustrated on Figure 02:

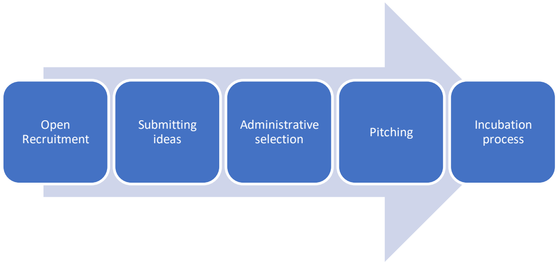

Figure 02. Pre-Incubation Stages of Amoeba Digital Business
Source: Processed data

Number of Applicants

In terms of the number of applicants in each recruitment process, the results show that the average number of applicants in the past year was 600 to 700 ideas. Meanwhile, it reached 500 ideas in 2019. It can be concluded that the average number of applicants is predicted to reach 500 ideas. This number has greatly increased compared to the opening of recruitment in 2017-2018.

Percentage of Applicants

A total of 500 applicants will be selected to take the top 100 for the pitching stage. Participants who pass the pitching stage are limited to only around 20 teams to take part in the incubation program at Digital Amoeba center, Jakarta.

Target

This part focuses on the targets determined by the incubator in tenant acceptance. The results showed that there is no minimum target for applicants but there is a maximum target for ideas that pass. Maximum target/maximum capacity for ideas that pass each batch considering the capacity of the Innovation Manager and the budget is a maximum of 60 teams.

Analysis of the Core Incubation Stage

Learning Program

This variable describes the learning program carried out during the core incubation stage. Referring to Bank Indonesia, the learning program is part of the role of the incubator, for example, improving the ability of tenants to manage their business. Hillemane, Satyanarayana & Chandrashekar (2019), Gerlach & Brem (2015:295), and Wiggins & Gibson (2003:58) explain that learning programs include technical, legal, business, and access to funding. In these businesses, technical and legal aspects are integrated with sharing programs, namely mentoring, coaching, seminars, and workshops. However, the curriculum of this learning program activity is not stagnant in each batch as there is always interaction using a quite similar framework.

Digital Amoeba provides various learning programs. Before pitching in front of the judges, the Amoeba's are first provided with pitching knowledge including preparing material, pitching steps, and others. Amoeba Management (AMA) brings in people who are experts in their fields to provide knowledge for the tenants. Activities regarding the learning process are carried out at Digital Amoeba Center, Jakarta. The Amoeba Digital Program makes employees mentally start-ups and familiarizes Amoeba's with learning by doing. Digital Amoeba plays a role as an umbrella to protect the mistakes of the Amoeba's so that they are not too fatal. As for the validation stage, Digital Amoeba applies 4 innovation policies consisting of Customer Validation (CV), Product Validation (PV), Business Model Validation (BMV), and Market Validation (MV). The learning program carried out by the Digital Amoeba incubator can be seen in Figure 03.

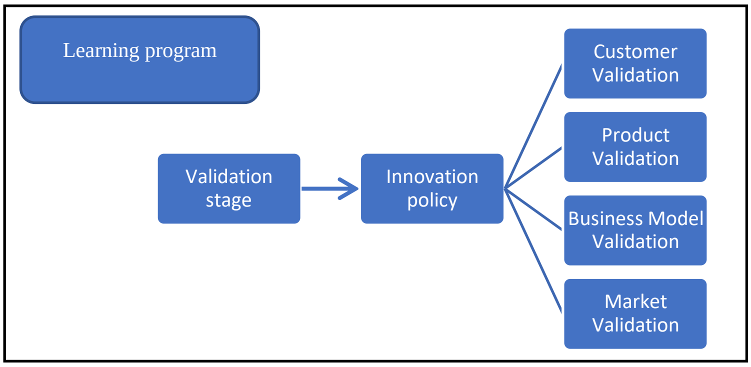

Figure 03. Learning program at Digital Amoeba
Source: Processed data

Sharing Program (Mentoring & Coaching)

The sharing program consisting of mentoring and coaching is key in the incubation process. This sharing program is a part of the service as referred to by Bank Indonesia. The mentoring program is needed to help form strategic planning, control quality and develop the learning process, and ensure that the process runs comprehensively as needed (Vanderstrataeten & Matthyssens, 2012: 665). According to N5, the sharing session program is divided into five, namely, training, coaching, mentoring, counseling, and consultation. Mentoring sessions are carried out by inviting certain mentors depending on the field to control the goals and achievements of each team. Besides the mentoring program, Monitoring Evaluation (MonEv) program is conducted every two weeks. Benchmarking is not routinely carried out, but there is also participation in major events such as TechIn Asia and other events according to their fields and Community Review where the program aims to evaluate each team by the jury of fellow Amoeba's. During the Community Review, the Amoeba's shared their problems and then gave each other advice. One of the obstacles that occurred during the sharing session was when the Amoeba teams tell their problem and then they were given advice by other Amoeba teams or from management but the tenant's knowledge is not sufficient to accept it so there is a misperception in the application. The sharing session program can be done anywhere, either in the office or outside the office depending on the management and the willingness of the mentor. The scheme of the sharing session program on Digital Amoeba is can be seen below:

Seminar and Workshop Programs

This workshop program mechanism is similar to the seminar program which is included in skill development services. The mechanism is the same as conferences, seminars, and training (both individual and group training). The system is the same using top-down and bottom-up systems to suit the needs of the tenants. The implementation system is that the tenants only need to wait for the announcement from the AMA team and then register themselves as needed. The seminar and workshop program is divided into two organized by Amoeba Management (AMA) and some are based on requests from Amoeba's team.

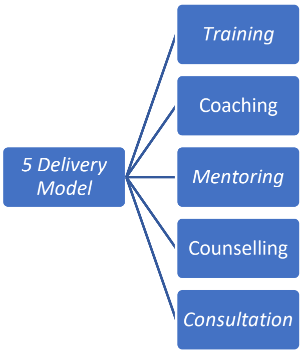

Figure 04. Sharing Session Program on Digital Amoeba
Source: Processed data

Funding Program

The Amoeba's team that passes the selection will be funded by the Satellite Amoeba Management (AMA) for each region which has been approved in advance by AMA Corpu in accordance with Telkom's PER 50. To get the incubation fund, the tenant has to submit in advance using a proposal with the provided template so the tenant just needs to fill out the template. If the budget plan is in accordance with the KPI and is reasonable, then the fee proposal can be approved by Amoeba Management and the funds will be disbursed as soon as possible via a cash card that is given to each tenant. All types of transactions have to be accounted for by reporting them to the AMA system. In terms of the amount of funds, all informants from N1 to N8 agreed that the amount of funds provided for each stage, namely, the maximum of 30 million Rupiah for CV, 120 million Rupiah for PV and BMV stages, and 1 billion Rupiah at the MV stage. The source of the funds comes from the incubation fund of PT. Telkom Indonesia.

Networking Program

The networking program is quite complex as it deals with external parties. This program is a form of synergy provided by the incubator, in which collaboration is formed between all parties, both internal and external parties. This networking program is important as a business support service for incubators and tenants (Ratinho, Harms & Groen, 2019: 165). To support tenants to be known in a wide market, incubators carry out various methods including holding major events such as AMIGO, Tech Talk, and Digital Amoeba Fest where the invitees present the partner companies from PT. Telkom Indonesia Tbk. or others. Another form of support is by introducing Account Managers from the Customer Facing Unit of external companies with the aim that when tenants need assistance from external companies, the AM can help make things easier. In terms of the networking process, it can be obtained from anywhere, but product transactions must be carried out under the name PT. Telkom Indonesia because Digital Amoeba is under the auspices of PT. Telkom Indonesia.

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Facilities (Physical & Non-Physical)

This variable discusses the facilities provided by Digital Amoeba for Amoeba's team. Besides funding, the infrastructure of PT. Telkom and other resources owned by PT. Telkom can be utilized by Amoeba's team. There are also physical facilities in the form of working space, while non-physical facilities are intangible, for example, trust, training, mentoring, freer working time, learning process, networking both internally and externally, visiting other companies, server to support production activities as well as a larger network. The working space of Amoeba's team is from the incubation fund proposed by Amoeba's team. The incubation fund has doubled starting from resources, human resources, operational costs, and others.

Analysis of Post Incubation Stages

Evidence for Attending the Program

This part discusses the evidence that Amoeba's team has attended the incubation period. They need to meet some requirements to reach the graduation stage, for example, passing the Market Validation stage, meaning that it affects both revenue and cost efficiency, when the user can solve the problem, has a clear market segmentation, has a return customer, and has achieved cost efficiency. If the tenant has not reached zero EBITDA, they can pass as long as they have high revenue and cost efficiency in which they are no longer chasing income but reducing the cost. The Amoeba's team can be declared to have passed the incubation period after going through the Amoeba Internal Committee Session (SKIA). In line with the other informants, to pass the incubation stage, one must go through the Amoeba Committee Session (SIA) process organized by the Digital Amoeba Committee. If the Amoeba's team does not go through the graduation process and the committee meeting, the Amoeba's team does not pass and that means the idea must be dismissed. The committee meeting produced an Official Note (Nodin). The official note contains terms and conditions to serve as a reference for the Amoeba's team to work legally. Besides, tenants are also given a kind of transcript in PDF form and some are in the form of virtual badges. If the tenants failed, they can return to join other tenants or return to being regular employees.

Programs

This discusses the program carried out when Amoeba's team completed the incubation process. The Amoeba's teams that have passed were divided into two, digitization and digitalization. Digitization is using the product of Amoeba's team internally by PT. Telkom Indonesia with the goal of cost efficiency, while digitalization is creating new revenue and creating a new revenue stream. The Business Model Validation (BMV) stage covers three stages. In the second and third stages, the Amoeba's team started the twinning process with their respective tribes if the Amoeba's team enters a subsidiary of T. Telkom Indonesia. Amoeba's team carried out a twinning process with related subsidiaries. The twinning process is a process of file transitions or adjustments starting from administration to how it works with related tribes and subsidiaries. For the tenants who have passed the graduation stage, they are usually used as instructors or sent to other companies to share experiences. Besides, as long as the tenant's status is still an innovator, they are entitled to receive training even though they have graduated. Meanwhile, if the tenant has left Digital Amoeba and joined another business unit or has returned to being a regular employee, then the tenant cannot get the training.

Accessible Facilities

This discusses the accessible facilities for tenants after passing the incubation period because the provision of facilities is predicted to be able to save tenants during the transition period. The transition period is a vulnerable period where tenants are not used to conditions outside the incubator. Business incubators still provide some services for tenants who have passed the incubation period, for example, human resources, capital, networking, equipment, business planning, and executive strategy (Lai & Lin (2015: 2287). However, the only accessible facility is co-working spaces. Because Digital Amoeba tenants are not provided with any other facilities apart from incubation funds and sharing session programs as these tenants are also still employees of PT. Telkom Indonesia. Thus, other facilities have been fulfilled by PT. Telkom Indonesia.

Sustainable Targets

This discusses the target of the incubator in producing tenants that can be directly absorbed by the market and survive. No theory clearly explains the target number of incubators that can survive after going through the incubation period. However, the more tenants that can survive indicates that the incubators have a high percentage of producing tenants that can survive in the market. One of the graduation requirements is having a consumer, but the number of the graduated target tenant has not been set. Only 13 teams have completed the graduation process so far. the target set is more to the total impact and it is still informal. Since 2019, targets have been set for startups that can survive or be directly absorbed by the market, namely 2% to 3% of the percentage of Amoeba.

Impact

This discusses the impact personally and for PT. Telkom Indonesia Tbk. is the holding company. The expected results of the assessment for the incubation program are personally, working hours become free in accordance with the predetermined target. According to one informant, participating in the Digital Amoeba program helps focus on doing something based on passion. Meanwhile, another informant states that the dominant impact is self-development which might not have been possible when serving as operational staff at PT. Telkom Indonesia. In terms of self-development, the informant feels far more benefits and gets lots of free facilities from Amoeba Management.

CONCLUSION

Digital Amoeba was established in 2017 which includes a program that becomes an incubator and accelerator for ideas owned by its employees in creating digital talent and digital businesses to contribute to the digital economy in Indonesia. The program is expected to find founders, provide funding and support the innovation until it creates something big for Telkom Indonesia. The selection carried out at Digital Amoeba is first, Amoeba's register and then check the idea by Digital Amoeba, when selected, Amoeba's will be called to pitch in front of the judges. Before the presentation, Amoeba's was given a briefing on pitching by Digital Amoeba, especially by Amoeba Management. The activities carried out by Amoeba's in the validation stage are Customer Validation (CV), Product Validation (PV), Business Model Validation (BMV), and Market Validation (MV). In the Customer Validation (CV) stage.

For the metrics used at the CV stage, namely Customer Validated Problem, it is seen from how likely the product offered can solve consumer problems in the market. At

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the CV stage Amoeba's was given an injection of funds up to RP. 10.000.000,-. Next is the PV (Product Validation) stage which takes a maximum of 12 weeks (3 months) to determine the suitability of the product produced with the wishes and problems of customers in the hope that the idea of Amoebas itself can be used as a solution to their current problems. In the PV stage, Amoeba's creates a prototype to introduce to potential customers. In conducting Product Validation, usually by GOOB (Get Out Of The Building) or in other words conducting direct surveys of potential users. The next activity is Amoeba's making MVP (Minimun Viable Product) in checking the hypothesis that has been made. MVP is a product with key features that can attract early adopters and uses MVP Fit as a tool in validating it. The metrics used in the PV stage are Active Users, looking at how many users are actively using the products/services offered. Injections of funds that can be obtained at this stage up to Rp.120,000,000.

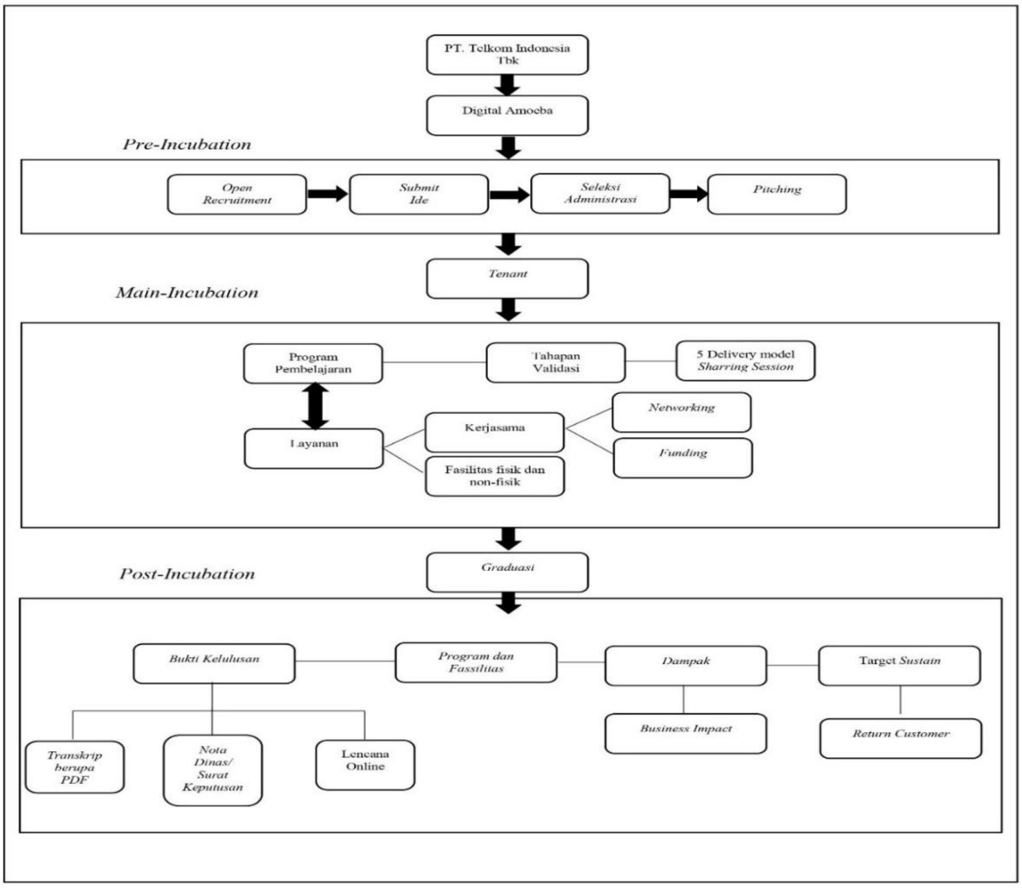

Figure 05 Conclusion of the Findings

The next stage BMV (Business Model Validation) is to validate the user's willingness to pay for the idea generated by Amoeba's or find a way to get money from the idea. This stage identifies the potential of the business model, and also measures the level of monetization over a period of time. Activities carried out by Amoeba's during the BMV stage include forming a revenue model, analyzing the willingness of consumers to pay for the ideas offered. Using Initial Revenue as a validation tool as well as measurement metrics, at this stage Amoeba's also establishes relationships with partners.

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The time period given during the BMV stage is a maximum of 12 weeks (3 months) and the budget given can reach Rp. 120,000,000, - The fourth stage, MV (Market Validation), is market validation. Market validation is done to find out whether the idea generated can be sold in the market or monetize the idea in a larger target market scope, to achieve an acceptable level of monetization in a more complex ecosystem. Amoeba's activities include marketing the product, shaping the revenue model, establishing relationships with partners and using revenue as a validation tool. The more people who use and pay for the idea, the better. The metrics used at this stage are Initial Revenue in the form of revenue projections. The MV stage is carried out with a maximum time limit of 24 months (2 years) and the budget given can reach Rp. 2,000,000,000, - If it has passed all four stages, the resulting business can enter the commercial phase, where the company is no longer a startup, but has become a corporation.

In order for the validation process to stay on the right path, there are monitoring activities carried out by Digital Amoeba, namely Monev (Monitoring Evaluation). Monev is Amoeba's monitoring and evaluation scheme in carrying out the validation process. Monev is conducted to determine whether or not Amoeba is advancing in a validation stage. Other programs in Digital Amoeba besides Monitoring Evaluation are Mentoring and Coaching. The program will connect Amoeba's with mentors who are competent in the start-up world. The Mentoring and Coaching Program is expected to realize the vision of Digital Amoeba as The Real Game Changer in Telkom Indonesia. Based on the findings in each aspect, detailed findings can be seen in Figure 05.

LIMITATION

The number of respondents is not as many as the author expected. There is limited respondents in Digital Amoeba's Bandung, so the researcher found difficulties while finding data sources. The distance of respondents was not as imagined by the researcher, so the researcher had to go to Jakarta and also conduct interviews through zoom meetings.

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Feasibility Study For The Establishment of The Center For Data Science Studies at UIN Sunan Kalijaga Yogyakarta

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Abstract–With the rapid development of data science research and its more comprehensive application, and to support the integration-interconnection adopted by UIN Sunan Kalijaga Yogyakarta, it is necessary to have an institution overseeing it. This article discusses the feasibility study of establishing a Center for Data Science Studies using SWOT analysis. Furthermore, it discusses the ideal profile of the Center for Data Science Studies, including organizational management, activities management, resource management, and financial management.
Keywords: *data analysis, data science, SWOT, feasibility study, management*

INTRODUCTION

The increasing number of internet users accessing via computer and smartphone has led to a significant increase in the need for data processing and data analysis. In addition, agencies that require decision-making are also starting to pay attention to aspects of agency data, which are increasing in number. Therefore, the concept of a standard statistical method used to process data is deemed necessary to be further developed so that it can be used to process relatively large data.

Data science is a multidisciplinary science, especially mathematics, statistics, and computing, which are currently experiencing very rapid development, especially in the big data and industry 4.0 era. Apart from support from Artificial Intelligence (AI) and the Internet of Things (IoT), the development of data science is also supported by the rapid growth of statistical and computational methods. The primary role of statistical methods in data science lies in the collection, processing, and presentation of data, along with its analysis.

The advantage of data science lies in its ability to identify and solve problems faced by agencies and industries based on the data they have so that the results needed are used in decision-making. The demand for this is increasing, along with the emergence of start-up companies and problems in government and private agencies that require fast and accurate decision-making support based on their data.

The Department of Mathematics, Faculty of Science and Technology, UIN Sunan Kalijaga, with a focus on Statistics and Applied Mathematics, has an excellent opportunity to study and develop data science. Currently, the Department of Mathematics already has a sufficient number of lecturers with expertise in statistics and mathematical modeling. Unfortunately, the Department of Mathematics still needs a platform to facilitate more structured data science research and development activities. This can be seen from the lecturers' research activities and studies on data science which need to be coordinated and tend to form a particular central theme. The concept of integration-interconnection between Islam and Science is adhered to by UIN Sunan Kalijaga Yogyakarta and provides additional motivation for establishing a Center for Data Science Studies. The resulting data science research can have a positive impact in helping to solve various problems, such as in information technology and the economy, including in the social, religious, and community fields.

This study aims to analyze the feasibility of establishing a Center for Data Science Studies as a forum for the academic community of the Department of Mathematics to study, develop and apply data science within the Faculty of Science and Technology UIN Sunan Kalijaga Yogyakarta. This study uses SWOT analysis to conduct a feasibility study on establishing a Center for Data Science Studies. Based on the SWOT analysis obtained, the study center's ideal profile and management design will be formulated. SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) has been widely used to test the feasibility of establishing an institution. The analysis consists of two aspects, namely internal and external aspects. The results from the SWOT analysis can show the level of assessment of strengths, weaknesses, needs, evaluations, modifications, and strategies of owned resources.

According to Fatimah (2016), the SWOT analysis has four things that are main reviews, namely: (1) Strengths, which means strength, is a substantial capital that can be relied on by an institution so that it can understand and know correctly in preparing the vision and mission, as well as future institutional plans; (2) Weaknesses, which means weakness, are deficiencies and limitations that are already owned so that it is expected to be able to anticipate these deficiencies and limitations so that they do not become obstacles to achieving further plans; (3) Opportunities, which mean opportunities, are favorable conditions, so knowing these advantages are expected to be utilized as an advantage towards the success you want to achieve; and (4) Threats, which means a threat, is an adverse condition. Various things that are detrimental to the institution must be considered carefully. Institutions must determine the steps in planning so unwanted threats will not occur.

The purpose of carrying out a SWOT analysis is to combine and integrate the four components mentioned above. The results of the SWOT analysis are expected to be able to prepare strengths, prevent weaknesses, look for opportunities and determine steps to prevent threats from occurring. If these four components can be appropriately implemented, the vision and mission can be achieved successfully to obtain the best and optimal results.

Research related to the analysis of the feasibility of establishing an institution can be found in Hamim and Nurman (2006) regarding the feasibility study of establishing a Masters in Administrative Science Study Program. The research aims to prepare experts who are equivalent to masters. The method used is interviews with alums of undergraduate students. The conclusion of this study is the feasibility of establishing a Master’s in Administrative Sciences. In addition, Sutika et al. (2017) research results regarding the feasibility study for constructing the Cokroaminoto shopping center in Denpasar City. This study aimed to determine the feasibility of the Denpasar City government's asset development plan. The method used is observation and interviews. The conclusion of this study is the feasibility of establishing the Cokroaminoto shopping center.

Hadi et al. (2010) examined the feasibility study of establishing a Rural Bank, “Bank Perkreditan Rakyat” (BPR), in Tanah Bumbu Regency. The purpose of this research is to find out whether or not the establishment of a BPR is feasible from a financial perspective. The method used is secondary data analysis from government agencies. This study concludes that it is possible to establish a BPR because the Regional Budget and Revenue Expenditures (APBD) are quite large in Tanah Bumbu Regency. In addition, Hartoyo (2010) has studied the feasibility study for establishing a local

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television Public Broadcasting Institution (LPP) in Banyumas Regency. This research aims to see from the legal aspect and the community's response to selecting the LPP. The research method used is primary and secondary data collection. This study concludes that there is feasibility in establishing LPP.

Oktaviany et al. (2016) have examined the feasibility study of establishing a coconut oil manufacturing business in Luwuk, Central Sulawesi. This study aims to determine whether it is feasible or not to establish a coconut oil manufacturing factory. The research method is based on aspects: market, technical, management, finance, socio-culture, and environment. The conclusion of the establishment of this coconut oil manufacturing business is that it is feasible to establish a business. Farid (2019) also reviewed the feasibility study of establishing a chicken feed factory using the Net Present Value (NPV) method. The research location for the study of the establishment of an animal feed factory is Pasaman Regency, West Sumatra Province. Factory establishment considers several aspects: marketing, technical and technology, management and organization, environment, law, and finance. The conclusion from this research on establishing a factory is that it is not feasible to set up a factory.

LITERATURE REVIEW

SWOT Aspects of Center for Data Science Studies from the Human Resources Side

SWOT is an acronym for strengths, weaknesses, opportunities, and threats. SWOT analysis on human resources considers two factors, namely: internal and external. These two factors can improve or hinder the Center for Data Science Studies. SWOT analysis is an important step that institutions can take and helps accelerate the proactive pace of study centers regarding strategy improvement.

The Strength of Center for Data Science Studies from the Human Resources Side

Institutional strength is an internal human resource factor that enables strategy and function to run as well as possible. The human resource strategy aims to create a high-quality workforce and dream institution. The human resources function involves an operational session, namely a staff gathering session on family benefits and health insurance. The internal strength of human resources includes the leadership that supports strategy development. Another internal factor consists of staff knowledge and expertise, which is responsible for carrying out tactical tasks.

The Department of Mathematics, State Islamic University (UIN) Sunan Kalijaga (Suka) has six doctoral and eight master’s teaching staff. All doctoral and master staff have expertise in Data Science. Many students also study data science, so they can help to teach staff at the Department of Mathematics, UIN Suka. Several courses that help students learn Data Science is Statistical Methods, Mathematical Modeling, Data Exportation, Sample Survey Methods, and others.

Weaknesses of the Center for Data Science Studies from the Human Resources Side

The SWOT analysis examines the weaknesses of the institution. Weakness is also an internal factor that is one of the challenges for the institution. Internally, budget constraints and cuts are problems that institutions often face. This is because human resources is not a department that makes money. Human resources must rely on a solid justification for funding investment in institutional activities. However, money is only one of the weaknesses of human resource management. Another area for improvement in human resource management is staff morale and high staff turnover. This morale is a staff dissatisfaction with the institution.

Opportunities for Center for Data Science Studies from the Human Resources Side

One of the external factors for human resource management is the opportunity to increase staff due to the increasing demand for data processing and services produced by the institution. Business growth is defined as a change in salary for the better or higher wages for current staff. Along with market demand, agencies can recruit more staff. External factors also emerged as the institution's ability to obtain the unique talents of existing staff. This can improve the institution's reputation and business ranking.

Threats of the Study Center Institute from the Human Resources Side

Negative external factors are threats to institutions and will eventually impact human resources. The competition between agencies will affect institutional profits, slowdowns, staff reductions, or institutional closures. Another external threat factor is the offer of better wages or benefits from other institutions. This can affect the quality of work in the institution.

Human resources cannot always protect institutions, but it is an area that needs attention. Institutions need to regularly provide assessments in the form of compensation structures and staff opinion surveys. This can improve staff-to-staff relations and strengthen staff-leader relationships. Human resources are expected to become business partners in the institution's business strategies.

SWOT Aspects of the Center for Data Science Studies from the Management Side

Strengths: The Center for Data Science Studies has qualified management staff. Weaknesses: The institution needs more staff in business management. Opportunity: There is good market growth, such as the need for data requests from students, government, and private companies. Threats: The agency needs more financial or accountant-savvy staff.

SWOT Aspects of the Center for Data Science Studies from Partners

Strengths: The Center for Data Science Studies has partners from several alums who have worked in government agencies and private companies. Weaknesses: A new institution is about to be established. Opportunity: Institutions have options because there are few or no data science study centers. Threats: The institution needs to be approved by the central leadership of the university.

SWOT Aspects of the Center for Data Science Studies from the Side of Stakeholders

Strengths: The Data Science Study Center Institute is fully supported by the Head of the Department of Mathematics, UIN Sunan Kalijaga Yogyakarta. Weaknesses: This institution has no weaknesses in terms of stakeholders. Opportunities: Stakeholders can help promote to government agencies and private companies. Threats: From a stakeholder perspective, there is no threat.

SWOT Aspects of the Center for Data Science Studies from a Financial Side

Strengths: Central Institute for Data Science Studies was funded initially by the university. Weaknesses: This institution has no weaknesses. Opportunity: The institution

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will generate much income financially ahead of regional and national elections. Threats: Due to a large amount of income, there is an interest in disbanding or replacing the leadership and staff of an institution that is already running.

Table 1 summarizes the SWOT analysis regarding human resources, management, partners, stakeholders, and finance. Table 1 is to make it easier for us to understand this SWOT analysis briefly.

Table 1. SWOT Analysis of the Establishment of a Center for Data Science Studies

No.	Criteria	SWOT Indication			
		Internal Conditions		External Conditions	
		Strength	Weakness	Opportunity	Threat
1	Human Resources	The Mathematics Department has six doctoral and eight master's degrees. Students also assist the Mathematics Department with data science knowledge.	Reduction in salary for staff due to competition in the data processing business. Staff needs more enthusiasm at work because there is saturation.	Increase in staff due to large data processing requests.	Competition between national data processing agencies.
2	Management	Expert teaching staff.	Staff who are business management experts still need to be created.	There are few centers for Data Science Studies.	The institution still needs a financial staff.
3	Partners	The institution already has partners and alums who have worked in state agencies and private companies.	A new institution is about to be established.	There are few centers for Data Science Studies.	The university leadership did not approve of the institution that wanted to stand.
4	Stakeholders	This institution is fully supported by the Head of the Mathematics Department, UIN Suka.	There is no.	Stakeholders have the opportunity to promote to government agencies or private companies.	There is no.
5	Financial	The university initially funded this institution	There is no.	Ahead of regional or national elections, many will want to request data in terms of data collection and data processing.	The Center for Data Science Studies is not receiving funding.

Source: Authors

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Ideal Profile Of The Center For Data Science Studies

This section will describe the profile of the Center for Data Science Studies, including the organizational structure, the job description for each structure, and the human resources that will fill the organizational structure. The presentation of this section will begin with a discussion of the organizational structure, while the job description and human resources will follow the design of the organizational structure. There are at least two approaches to designing the Center for Data Science Studies' organizational structure, namely the functional and structural approaches. Here is an explanation of the two systems.

Functional Approach

This approach is based on the premise that the organizational structure of the Center for Data Science Studies is formed based on the functions of expertise possessed by the resources of lecturers, researchers, laboratory staff, and educational personnel owned by the Department of Mathematics. Based on this idea, the structure of the Center for Data Science Studies consists of a director, several experts representing each field in data science, several advisory/consideration boards, a chairperson, several heads of areas for several fields to be formed at the Center for Data Science Studies, some staff in each field, and administrative staff. It is also possible to create a research group, namely researchers and graduate students conducting research at the Center for Data Science Studies. Based on the organs that allow for such formation, one alternative organizational structure of the Center for Data Science Studies is depicted in Figure 1 below.

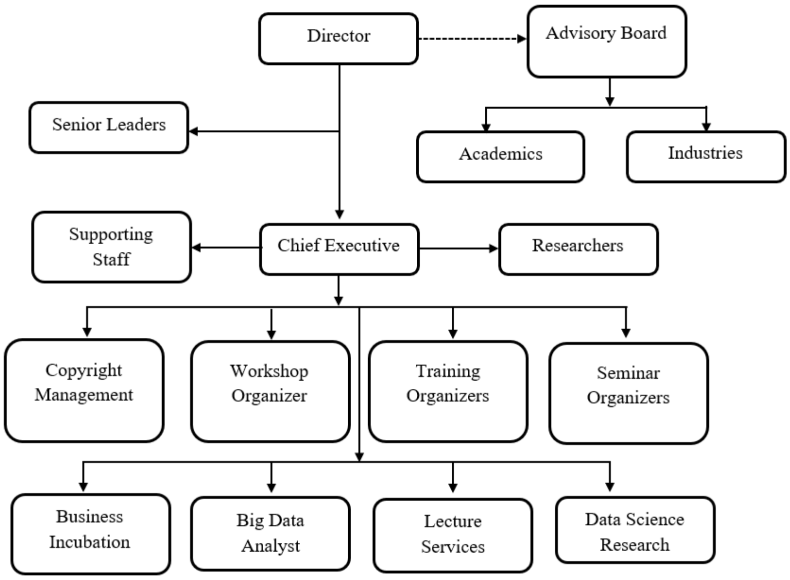

Figure 1. The Structure of the Center for Data Science Studies

Next, we will explain the job description for each organ in the organizational structure above. The Director is the main person in charge of the Center for Data Science Studies. He coordinates with senior leaders and advisory boards from academia and industry. The coordination is focused on efforts to develop a study center following the demands of the times. The Director is also responsible for cooperation between the study center and outside parties, academic, industrial, commercial, and professional.

Senior leaders are a group of data science experts in the Department of Mathematics tasked with assisting the director in the center's development. Senior leaders can be divided into three divisions, namely the program development division, the internal development division, and the data science product development division. Senior leaders work independently in carrying out their duties and can ask secretarial staff for help.

The advisory board is an expert whose job is to provide advice and consideration to the director about the development and implementation of activities at the center. The advisory board consists of two elements, namely the academic element and the industrial element. The academic element can be taken from professors and senior lecturers in the Department of Mathematics. In contrast, the industrial segment is taken from the leaders of companies engaged in data science. The advisory board can be active or passive in carrying out its duties. The advisory board's active role is carried out by providing advice and input to the director without being asked first. Meanwhile, the passive role means that they are waiting for the invitation to coordinate from the director.

A chief executive is responsible for carrying out all Center for Data Science Studies activities. The chief executive is in charge of several fields and is tasked with carrying out one work area. In carrying out his duties, the chief executive coordinates with the director to determine the focus of the work.

The Supporting Staff is tasked with supporting the chief executive and areas carrying out the center’s activities. The Supporting Staff has two primary duties: secretarial administration and financial administration. The Supporting Staff is headed by a chairman in charge of two divisions: the secretarial and finance divisions. Several employees from educational personnel in the Faculty of Science and Technology assist each division.

Researchers are those who conduct research at the Center for Data Science Studies. Researchers can be both graduate students and off-campus researchers. In conducting research, they are under the supervision of the chief executive. If the researcher needs to communicate with the fields, then it must be with the permission of the chief executive. The researcher's relationship with the Center for Data Science Studies ends the moment they complete their research. Furthermore, they were instructed to convey their research results to the Center for Data Science Studies director.

The copyright management division has the primary task and function of facilitating the management of products produced by the Center for Data Science Studies to obtain copyright certificates and intellectual property rights (HAKI). The working partner in this field is the Department of Law and Human Rights.

The workshop organizer division is tasked with holding workshops related to data science. Workshops can be held according to consumer demand or at the Center for Data Science Studies initiative in responding to existing market needs. Workshops that are stored can be carried out independently by the Center for Data Science Studies or in collaboration with other parties. The orientation of the workshop is more profit-oriented, but it does not rule out the possibility of being part of a community service program.

In line with the workshop organizers division, the training organizers division organizes a training series on data science. The duration of training is usually longer than that of workshops. The training programs are oriented to provide specific expertise in data science. Training instructors are prioritized to come from experts in the Department of Mathematics who master the training theme.

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The seminar organizers division has the main task of organizing national and international seminars on data science. The seminar activity aims to disseminate research results in data science and as a place to exchange ideas between data science experts from various countries. The seminar activity also aims to initiate cooperation with the parties present in the seminar. Likewise, seminars can be used to socialize the existence of the Center for Data Science Studies in the international community.

The business incubation division has the primary task and function of accommodating all products produced by the Center for Data Science Studies to be communicated with industry, government, and other stakeholders. This field bridges the products produced by the Center for Data Science Studies so that they continue to report the effects but can be utilized by the broader community by offering the products to industry, government, and other stakeholders.

The primary data analyst division conducts a series of analyses of big data presented. The focus of this field's work is more on the function of big data analysis services from consumers who entrust it to the Center for Data Science Studies.

The lecture services division provides lectures to students at the request of the requesting study program or major. Lecture services can be lectures for an entire semester or only in a few meetings as guest lecturers.

The science research division has the function of researching the development of data science. The research carried out can be in the form of primary or applied research. Basic research aims to develop concepts and theories and construct new ideas about data science. Meanwhile, applied research seeks to solve data science problems based on existing concepts and theories. It can also be in the form of developing existing problem-solving algorithms into more accurate, effective, and efficient algorithms.

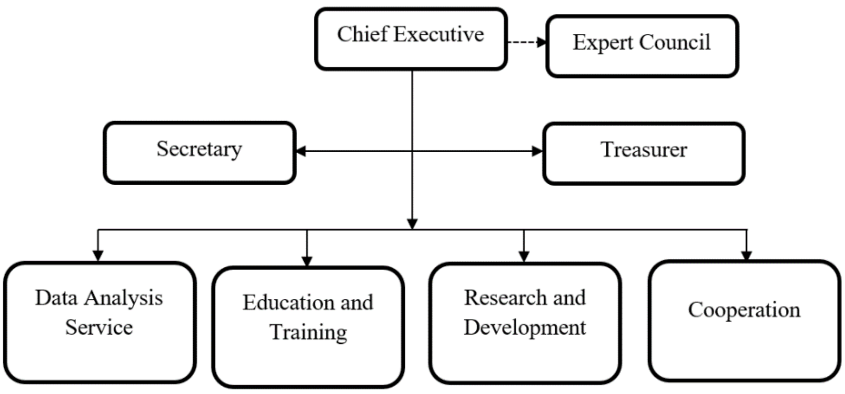

Figure 2. The Organizational structure of the Center for Data Science Studies

Structural Approach

This approach departs from the premise that the organizational structure of the Center for Data Science Studies is formed based on the type of activity to be carried out. Based on this, the organizational structure of the Center for Data Science Studies may consist of a chairman, secretary, treasurer, and several areas that handle activities. Possible areas to be formed are the data analysis services division, the education and training division, the research and development division, and the cooperation division. Based on the organs that allowed being formed, one of the alternative organizational structures of the Center for Data Science Studies is depicted in Figure 2.

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The job description of the main tasks and functions of the organs in the structure above is the same as previously described. The emphasis on the design of this model lies in implementing the activities of the study center. In this case, the study center has the characteristics of being an executor of scientific activities and development.

Human Resource Management

Human resources are essential to support the development and growth of the Data Science Center Institute, UIN Suka. Human resources need to be managed with good management to be optimal. If human resources are managed properly, this institution will run well. Before this institution was established, there needed to be a workshop on management governance, one of which was human resource management. In this workshop, human resource management will be studied in terms of career and salary.

Institutional leaders must make decisions with valid data regarding the staff under them. The selection of these staff will influence the development of the Study Center Institute. Leaders also need to establish a system for recruiting staff and processes for resignation, retirement, and dismissal. Leaders also analyze human resource data on the performance of each team. Figure 1 is the process of selecting the leadership and staff of the Data Science Center Institute. in the Department of Mathematics, UIN Suka. There are six doctorates; from the six doctors, you can choose one who is a doctor and an expert in Data Science. Furthermore, financial staff, operational staff, and teaching staff can be selected by the head of the institution based on the professionalism of the existing teaching staff.

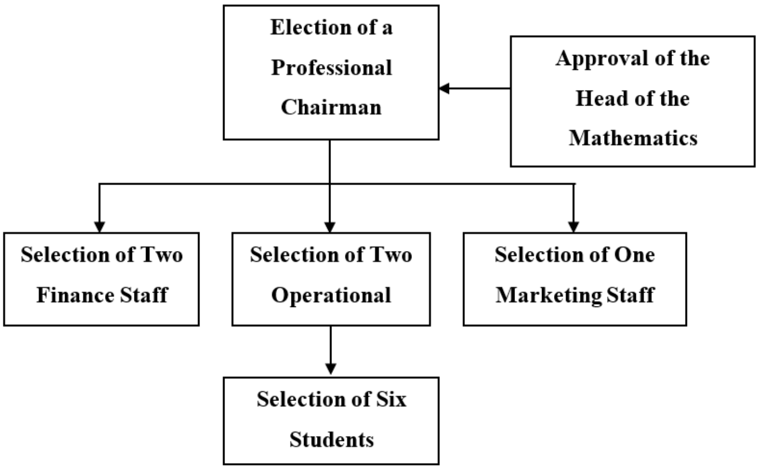

Figure 3. Selection of Leaders and Staff of the Center for Data Science Studies

Activities Management

Activities at the Center for Data Science Studies focus on three sectors: the education and training sector, the research and development sector, and the business incubation and community service sector. The following is described in detail in each of these sectors.

Upbringing and training. The education and training sector provides additional skills to consumers related to data science proficiency. Some of the things that can be done are: 1) Conduct additional teaching related to data processing and programming levels for the academic community, industry, and the general public; 2) Develop institutional cooperation to improve the quality of human resources, both at the local,

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national, and international levels, related to data science, advanced programming, and big data; and 3) Organizing national and international seminars/workshops on data science, advanced programming, and big data analysis.

Research and Development. The research and development sector has responsibilities in terms of developing data science. This is done by conducting data science research in a structured and sustainable manner. Here are two things the sector can do: 1) Consulting research data analysis cooperation with lecturers/researchers from internal campuses, universities, and other institutions outside the campus; and 2) Scientific development and application of data science, advanced programming, and big data.

Business Incubation and Community Service. The business incubation and community service sectors are a follow-up to the other two existing sectors. This sector plays a role in following up on products produced by the Center for Data Science Studies so that the industrial world and society can utilize them. Some of the things that can be done include: 1) Organizing training related to data processing and advanced programming for the academic community, industry, and the general public; 2) Provide in-house training services to stakeholders (industries) related to data science, advanced programming, and big data analysis; and 3) Carry out cooperation with business actors and industry to build start-ups in data science, advanced computing, and big data analysis.

Financial Management

The sustainability of the Center for Data Science Studies requires sound financial management; this is because finance drives research and development activities. Therefore, finance must be managed effectively and efficiently through financial management that adheres to financial management principles. The principles that must be possessed in financial management are the principle of transparency, the focus of accountability, the principle of effectiveness, and the principle of efficiency. These four principles are applied to the study center's financial management process, which starts with the planning and budgeting process, continues with the implementation and monitoring processes, and ends with the evaluation process.'

In the financial planning process, the Center for Data Science Studies must carry out budgeting activities at the beginning of the year through the Draft Budget called Rencana Anggaran Biaya (RAB). Financial planning is carried out for one year through joint discussion meetings to determine plans for activities to be carried out. In the panel to decide on the RAB, an overview of the use of finances in the short and long term will be produced, so that excellent and mature planning can be provided, including targets to be achieved for the following year.

The implementation process is based on the planning that has been implemented before. The RAB and previously planned needs allocate implementation and financial management at the Center for Data Science Studies. Unforeseen cost needs will be given from activity funds that have yet to be implemented. Every time an activity is carried out, all income and expenditure transactions must be recorded, and proof of the transaction must be attached as a form of accountability to UIN Sunan Kalijaga Yogyakarta. All funds spent must aim for data science research and development activities.

The head of the study center carries out the supervisory process and financial accountability activities as well as all activities of the Center for Data Science Studies annually in the form of a report to UIN Sunan Kalijaga Yogyakarta. As a form of internal control, an internal report is required, which is issued once a month. This monitoring and accountability process is essential to ensure that all available resources are allocated for activities by the previously prepared RAB.

The financial evaluation process is based on the results of the Center for Data Science Studies's financial accountability reports relating to all financial resources and activities implemented. Evaluation is carried out on all targets that have been achieved and their conformity to the objectives previously determined as the initial plan. The internal evaluation process must be carried out regularly between the leadership and study center members at least once every month. Every year, the head of the study center must account for all funds issued to UIN Sunan Kalijaga and all targets that have been achieved and have yet to be achieved for one year.

Financial management implementation must be based on transparency, accountability, effectiveness, and efficiency principles. Transparency in financial management means there is openness in financial management activities, such as in sources of funds and the amount and details of the funds used. The principle of accountability in financial management means that the funds issued must be by the previously determined RAB. The focus on effectiveness in financial management means that the allocation of funds must be used to support the activities of the study center to achieve the stated goals, and the results are by what has been planned. The principle of efficiency in financial management means that allocating funds supports attaining optimal results. This is reflected in the increase in service and quality of study centers in research and development.

Cooperation Management

The management of this cooperation is focused on four indicators. The four indicators of cooperation management are (a) planning; (b) organizing; (c) briefing; (d) supervision. Planning is determining what will be done in advance at a specific time, whose staff will do it, what results, and what factors will influence it. In this plan, the collaboration will be carried out by the Central Institute for Data Science Studies in partnership with the Central Statistics Agency (BPS) of Bantul Regency, Special Region of Yogyakarta (DIY). The partnership will be carried out by collecting poverty data in Bantul Regency. Retrieval of poverty data in Bantul Regency is a step to determine how severe poverty is after Covid 19. In addition to BPS Bantul DIY, planning for collaboration is being carried out by the Center for Data Science Studies with the DIY Tax Office. The DIY Tax Service cooperates to record motorized vehicles in arrears of taxes. This is done to determine the potential DIY income received in 2023.

The collaboration between the Center for Data Science Studies was carried out with the Bantul Regency BPS and the DIY Tax Service. The head of the Center for Data Science Studies, one finance staff, one operational staff, and one marketing staff visited the Bantul Regency BPS office and the DIY Tax Service. The principle of this organization is coordination with the Bantul Regency BPS and the DIY Tax Service. The coordination of the Center for Data Science Studies and the Bantul Regency BPS is regarding poverty data in Bantul Regency. Coordination is carried out regarding the number of students deployed. The number of hamlets in Bantul Regency is 934 hamlets. If two students collect poverty data for each hamlet and the two records ten hamlets, then 94 students are needed. Poverty data collection in Bantul Regency with many students aims to make the data valid. Coordination between the Center for Data Science Studies and the DIY Tax Service is regarding motorized vehicle data that is in arrears. Only a few students are involved in this activity. It is enough for two students to record motorized vehicles that are late paying taxes and how many years they are late paying.

The briefing of the Center for Data Science Studies and BPS Bantul was carried out with the Regent of Bantul Regency. Furthermore, providing input and direction to the Regent of Bantul and his staff regarding steps that can be taken to reduce poverty in Bantul Regency. In connection with the order of the Center for Data Science Studies and the DIY Tax Service, they discussed tax exemption and reported it to the DIY Governor. Poverty and motor vehicle taxes are closely related. If poverty can be reduced, motor vehicle taxes in arrears can be reduced.

Supervision is entirely carried out by both parties, namely the Center for Data Science Studies and the Bantul Regency BPS for poverty data. In contrast, supervision for motor vehicle data that is in arrears is the Center for Data Science Studies and the DIY Tax Service. This is done entirely professionally, so the data is authentic. Supervision is carried out so that work is done on time.

CONCLUSION

Based on the SWOT analysis that has been carried out, the results show that it is feasible to establish a Data Science Study Center by considering the following: 1) Trends in the need for data analysis are increasing in various fields, including the social and religious areas; 2) Availability of human resources with skills in mathematics, statistics, and data science computing; 3) There must be a forum to facilitate more structured data science research and development activities. Lecturers' research and studies on data science are not coordinated and do not yet tend to form a particular big theme; and 4) UIN Sunan Kalijaga owns the concept of integration-interconnection between science and religion.

From the results of the feasibility analysis of the planned establishment of the Data Science Study Center, the following suggestions are obtained: 1) The discourse on establishing a Data Science Study Center needs to be followed up with the publication of documents ratified by the competent authority; and 2) Efforts need to be made to improve the quality of human resources in quantity and quality as the principal capital of the Center for Data Science Studies.

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