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The Readiness of Management Operational Standard as The Basis of Adopting Industry 4.0
Studi on Sharia Cooperative in West Java Indonesia

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Abstract

The aim of this research is Evaluates the Management Operational standard and the level of readiness of Sharia Cooperatives in West Java for adopting the Industrial 4.0. Method: descriptive surveyed to 191 sharia cooperative practitioners, interviewed the leaders of 39 sharia cooperatives, reviewed sharia government regulations including MUI Fatma. The data processing used descriptive analysis. Result: Empirical facts show that all sharia cooperatives already have management operational standard but not yet connected with the readiness to adopt industry 4.0; then the highest ready indicator is “consistently to AD/ART, SOM, SOP, and policy patterns while the lowest ready is “use of Electronic signatures as a verification and authentication tool.”. *Conclusion:* The management operational standard should be always adjusted with the provisions for the use of technology to provide maximum services. The implication of this research that government issues policies for Islamic cooperative managers to implement management operational system (MOS), containing provisions that require IoT technology.

Keywords:
Management operational standard, sharia cooperative, Industry 4.0, Readiness of Industry 4.0 adopting
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1. Introduction

The potential for sharia economics and finance in Indonesia has extraordinary power to be developed. Sharia financial industry assets have reached IDR 2,375.84 trillion, an increase from 2021 of IDR 2,050.44 trillion or growing 15.87% higher than 2021. Sharia economics and finance in Indonesia are increasingly being taken into account in the international world. Indonesia is able to maintain 3rd place in the Islamic Finance Development Indicator 2022 (OJK, 2024). In Indonesia, cooperatives were born from an agreement between a group of people, they are still part of a business organization that seeks to obtain profits for all members as well as owners, so management operating standards are needed that balance economic and social motives. This motive can be reached by maximizing the services with optimizing technological developments. Although research findings by Pratama et al (2025). stated that the adoption of digital platforms significantly increased the flow of revenue, in West Java there is a gap among several cooperatives about the readiness of optimized technological used. This opinion is reinforced by Dinda et al (2025) who explained that digital transformation has a positive and significant impact on financial performance. M. Shofiyuddin et all (2024) stated that religious ethics moderates the relationship between digital transformation and MSME performance.

Sharia cooperatives are financial institutions that provide savings services, interest-free loans and profit-sharing based financing, based on Sharia principles which help alleviate poverty, create employment opportunities, help develop infrastructure: electricity, housing, health services. It means, Cooperative institutions are take an important role of economic growth (Lisa, 2016); (Lisa, 2016; Masduki & Anwar, 2022){Khourshed, 2023 p.7}; Panakaje et al, 2023)

The challenges and general problems in the development of sharia economics and finance in Indonesia: (1). Limited capital; (2). Lower acceleration of Sharia product innovation; (3). Limited human resource competencies of technology used development; (4). Limited Infrastructure. In particular, the problem with sharia cooperatives are:lagging behind in digital financial management, the business aspects of management and supervision (Masduki & Anwar, 2022), Da Silva, et al., 2022: Republika, 2023).

The “Fourth Industrial Revolution (Industry 4.0) is characterized by a range of new technologies like the Internet-connected technologies or IoT, provisions in management operational standard, increases the production efficiency and competitiveness of companies. All of this character create value added for organizations and society (Roblek, Mesco and Krapež, 2016; Nagy et al, 2018; Rocchi and Brissaud, 2023).

Several previous studies focused on “the implementation of Industry 4.0 without investigate about “management operational standard”. There have been limited studies concerned to several large companies and several MSMEs that were not sharia cooperatives. State of the art of this research is a readiness of management operational standard and industry 4.0 implemented on the sharia cooperatives. The objective of this research is to measure of sharia cooperative readiness to adopted industry 4.0”. The contribution of the results of this research is used as a basis for developing operational management standards.

2. Method

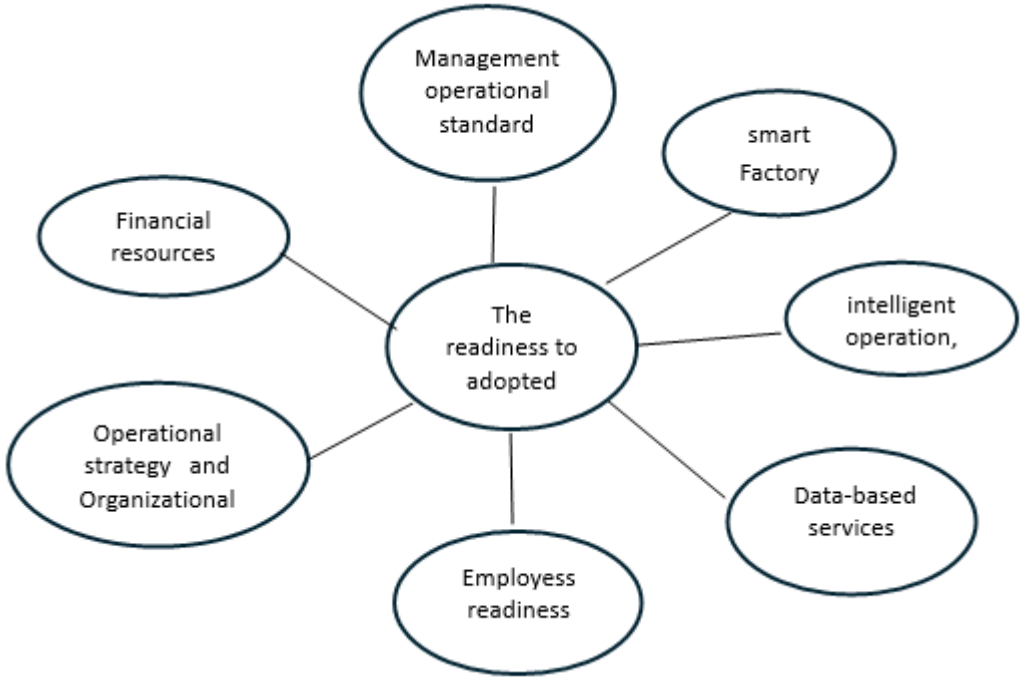
The research method used is a descriptive survey with a descriptive sequential mixed method design: Qualitative research to study operating management (SOM) standards then quantitative research to determine the readiness of Sharia Cooperatives in industry 4.0. Data that used are primary about the readiness for implementing industry 4.0, that have collected

by survey to each practioners and secondary about management operating standard from various government regulation.

The research population consisted of practitioners at Sharia Cooperatives in West Java, with respondent at several sharia cooperative representative of: Cirebon, Bogor, Depok, Cimahi, Bekasi, Tasikmalaya and Bandung cities; Cirebon, Kuningan, Bogor, Bandung, West Bandung, Sumedang, Subang districts. The sample size used 191 practitioners from 39 sharia cooperatives. Primary data were collected by survey used questionnaire on five a Likert scale; observation of the technology facilities and infrastructure; interviewed the leaders of sharia cooperative. Secondary data were collected through journals, government regulation, fatwa of the sharia council of the Indonesian Ulema.

Quantitative data was processed using SPSS 20, the descriptive measures used as the basis for descriptive analysis were the mean and standard deviation while the interview results were processed using content analysis and data reduction.

In this research, we want to know the position of Management operational standard in the readiness adopting industry 4.0 as whole, so the dimensions and indicators were developed from several previous research results about the readiness adopting industry 4.0, are following: Management operational standard, smart Factory, intelligent operation, Data-based services, Readiness of employees, Operational strategy and Organizational, and Financial resources (Khourshed, Elbarky, & Elgamal, 2023); Hang Wong and Hung Kee, 2022; (Grufman, Lyons, Sneiders, & Quarterly, 2020), Lyons, and Sneiders, 2021).



The Likert scale survey results then calculated of mean value and categorized it into several stages that describe the leveling of industry 4.0 adoption with the following categories:

Table 1. The categories of the readiness leveling industry 4.0 adoption

Range of mean value	Leveling	Achievement called
1,0 - 1,799	Level 1	Get to know communication technology

1,8 - 2,599	Level 2	Beginner Achievement
2.6 - 3,399	Level 3	Good achievement
3,4 - 4,199	Level 4	Excellent Achievement
More than 4,2	Level 5	Extraordinary Achievement

3. Result and Discussion

3.1 The Readiness Of Management Operational Standard

Judging from its history, cooperatives emerged in Europe in the 19th century when groups of citizens faced the pressure of financial exploitation by middle, upper class, then several governments at that time allowed these depressed groups to organize themselves to overcome these financial problems. This organization called as cooperative as a originate from the community, generally as grassroots organizations, which enable the community to carry out various collective efforts on a small scale, The uniqueness of a cooperative is that it is owned by its members from different backgrounds who are together in a democratic and equal way, managed by the 'one member, one vote' rule. Members share equal voting rights regardless of the amount of capital they put into the enterprise (Festa et al, 2021; Stoop, et al, 2021).

The basic principles of cooperative management are varied, giving rise to the consequences of cooperative operational management which are not simple, especially with technological developments that require a lot of adjustment activities (Hronová and Špa, 2021), therefore, "references" is needed as a guide in carrying out daily activities. The guide is Management Operational System (MOS).

We can say that Management Operational Standard Guidelines in Regulation of the Minister of State for Cooperatives and Small and Medium Enterprises Number: 35.2 /Per/M.KUKM/X/2007 as "a requirement" for the establishment of a cooperative institution. Especially for sharia cooperatives (units) it is also based on the several Fatwas from the National Sharia Council of the Indonesian Ulema.

Fatwas from the National Sharia Council of the Indonesian Ulema, including FDI number: 141/DSN-MUI/VIII/2021 Regarding Guidelines compile all work procedures starting from the basic articles of Association & bylaws, and all derivative regulations referring to the fatwa then evaluate the suitability of sharia principles in sharia cooperatives that have been implemented; FDI number 11/DSN-MUI/II/I9 which relates to provisions on the use of technology in providing service.

This survey looked at the readiness of "Management Operational Standard" preparing position compared with other aspects of readiness to adopt Industry 4.0. Base on the survey data showed us as follow:

Table 2. The detail map position of indicators of Management Operational Standard

Rank	Sub-Indicators	Mean value	Deviation Standard	Variance Coeficient	Readiness adopting Industry 4.0 Reached
01	Sharia cooperative operations refer to basic articles of Association (*Anggaran dasa*r),	4,5055	0,6458	14,33428	Almost the same, several sharia cooperatives are starting to enter extraordinary levels (level 5)

Rank	Sub-Indicators	Mean value	Deviation Standard	Variance Coeficient	Readiness adopting Industry 4.0 Reached
	bylaws (*Anggaran Rumah Tangga*), Management operational standard, Procedure operastional system, and policy patterns				
02	Availability of management operational standards	4,2896	0,7325	17,07586	Almost the same, several sharia cooperatives are starting to enter extraordinary levels (level 5)
03	Provisions for implementing technology-based services in management operational standards	3,7213	1,0076	27,07721	The achievements of sharia cooperatives are varied, on
04	The provision of information technology-based systems, infrastructure and services is provided free of charge.	3,4457	1,1247	32,63907	The achievements of sharia cooperatives are varied, on starting to enter a quarter of Excellent (level 4)
05	Use of electronic signatures as a means of verification and authentication	3,0598	1,1696	38,22532	Various achievements of sharia cooperatives in a good achievement (level 3)

All sub-indicators of Management Operational Standard reflects the normative aspects that apply in Indonesia so that it must be used as a reference by all cooperatives. Rank one is that sharia cooperatives have referred to the articles of association as implementation of Law No. 25 of 1992 article 7 paragraph 1 which states that "The formation of primary and secondary cooperatives is carried out by means of a deed of establishment containing the Articles of Association." It means, the Articles of Association as a reguirment of all cooperative organization establisment", also FDI number: 141/DSN-MUI/VIII/2021. While bylaws, Management operational standard, Procedure operastional system, and policy patterns as a implementation of the Articles of Association.

Rank two is "Availability of management operational standards' means tha all sharia cooperative that all sharia cooperatives have implemented of Regulation of the Minister of

State for Cooperatives and Small and Medium Enterprises Number: 35.2 /Per/M.KUKM/X/2007, regarding standard operational management guidelines.

Rank three and four shows that most of sharia cooperatives have been implemented FDI number 11/DSN-MUI/II/I9 which relates to provisions on the use of technology in providing service.

The lowest rank that "Use of electronic signatures as a means of verification and authentication, this position show that many sharia cooperative Many sharia cooperatives do not yet use electronic signatures. This has to do with concerns over data security

3.2 The Position of Management operational standard in the Readiness Of Adopting industry 4.0

The distribution of dimensions of readiness to adopt Industry 4.0 can be seen in Table 3. As follow:

Table 3. The rank data statistical results of Readiness Adopting Industry 4.0 dimensions

Rank	Aspects of readiness	Mean value	Achieving Readiness	Category
4	Management Operational standard (MOS)	3,804372	Level 4	Excellent Achievement
2	Smart Factory	3,864131	Level 4	Excellent Achievement
5	Smart operation	3,787670	Level 4	Excellent Achievement
3	Data-based services	3,834239	Level 4	Excellent Achievement
7	Employee readiness	3,508152	Level 4	Excellent Achievement
1	Strategy and Organization	3.955163	Level 4	Excellent Achievement
6	Financial readiness	3,637228	Level 4	Excellent Achievement
	The average score of Readiness Adopting Industry	3.602094	Level 4	Excellent Achievement

Base on mean value score, Management Operational standard (MOS) dimension in the forth position from seven dimensions, with its scores better than total score readiness adoption industry 4.0. (3,804372 to 3.602094), means most of the Sharia cooperative in the West Java comply with applicable cooperative legislation. However, there are three aspects whose readiness is higher: Strategy and Organization, Smart Factory and Data-based services which means that these three aspects receive greater attention in preparing for the adoption of Industry 4.0.

The achievement of all dimensions on excellence position, we can find out the readiness position of each dimension in more detail into four subcategories of the excellence achievement in the table 4:

Table 4. The detail map position of Excellent Achievement category (level 4)

Sub-category of level 4	Value mean range	Readiness position map for each dimension						
		Smart Factory	Smart operation	Data Base Service	Employee Readiness	Strategy & Organization	Financial Readiness	Management Operation Standard
extraordinary	4 - 4, 199	-	-	-	-	-	-	-
three-quarters	3,8 – 3,999	3,864	-	3,834	-	3,955	-	3,804
middle	3,6 – 3,799	-	3,787	-		-	3,637	-

	3,4 – 3,599	-	-	3,508	-	-	-
quarter							

From table 4, no dimension has yet reached an extraordinary position. Then based on readiness dimensions can be ranked from highest to lowest average value as follows: 1). Strategy and Organization, 2). Smart Factory, 3). Data-based services, 4). Management Operational Standard, 5). Smart operation, 6). Financial readiness, 7) Employee readiness. Most of sharia cooperative put "strategy and organization" as the main focus for adopting industry 4.0. These two words cannot be separated from the term management. Where management of funding, membership and Management Management Financing significant effect simultaneously and partially on the performance of sharia cooperatives (Bakhri, Munawar Albadri, & Fatimah, 2019). Cooperatives are institutions that provide mechanisms for handling collective activities, so an organizational structure is needed that supports the coordination of collective activities. The availability of an organizational structure is not sufficient, management participation is still needed for members and managers based on cooperative principles (Stoop, Brandsen and Helderman, 2021).

Although the concept of smart factory has emerged in the manufacturing industry, nowadays, the world is looking at smart factories as the fourth industrial revolution (Jeong, Bang, & Trade, 2018). Technology dominates the development of smart factories, technology also penetrates all business organization, so organizations who are try to establish a smart factory, they have to focus on their goals. A smart factory is not a goal in itself. A smart factory is a tool to achieve our goals. To create a successful smart factory, it is important to determine appropriate strategies to achieve goals considering the characteristics of the industry and the products they produce. From an organizational perspective, this shows the capabilities of the organization (Stoop, Brandsen and Helderman, 2021; Yuksel, 2022; (Abiodun, Rampersad, & Brinkworth, 2023).

Data-based services Data-based services talk about precise data, technology that processes data and optimal service for customers. Every service provider can collect data related to a customer's value creation process, analyze the data systematically using appropriate technology application, create and offer useful feedback information to its customers through a new service, and create new touchpoints to develop a continuous value co-creation relationship between provides with its customers (Lim, Kim, Kim, Kim, & Maglio, 2018); (Ji et al., 2022)

Conclusion

All sharia cooperatives have a Management operational standard, but not all sharia cooperative have included the technological used rules components. All aspects that determine readiness to adopt Industry 4.0 have not yet reached extraordinary levels so it is recommended that they need to be developed further. Specifically regarding standard operational management which is more about normative requirements, more about structuring in terms of procedures.

Base on this result, it can be suggested that in the governance of Islamic cooperatives, the government issues policies for Islamic cooperative managers to implement management operational system (MOS), containing provisions that require IoT technology.

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