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Information Sharing and Supply Chain Management in Improving the Performance of SMEs in the Era of the Industrial Revolution 4.0

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Abstract. Entering the era of the Industrial Revolution 4.0 has an impact on Small and Medium Enterprises (MSMEs) as a builder of the economic sector. the purpose of this research is to analyze the potential impact of information sharing and supply chain management on the performance of small and medium enterprises (SMEs) in the framework of the industrial revolution 4.0. The research method used a quantitative research type, the data was taken through a questionnaire with a non-probability sampling research method, namely the total sampling technique to 50 respondents and analyzed using multiple linear regression techniques. The tests carried out are instrument tests, classical assumption tests, f tests, and hypothesis tests using SPSS software. The results of data analysis in this study indicate that information sharing has a significant and sustainable direct effect on the performance of MSMEs. While the results of the analysis of the effect of sharing information do not have a significant effect on the performance of supply chain management in MSMEs in Temanggung Regency.

Keywords : Information Sharing, Supply Chain, MSMEs, Industrial Revolution 4.0

INTRODUCTION

Small and medium enterprises are part of a large deep supplier network the current economy. The network arose from the pressures of competition from suppliers and customers based on digitalization or Industry 4.0. In response against these pressures, companies implement different strategies to manage their supply chain (SC) partners. This research focuses on SMEs, because small companies have different prerequisites differ from large corporations and, therefore, different approaches in MSCM. For example, they are often in a position of lower bargaining power, in comparison with their bigger partners and therefore, they have to find solutions where they can motivate larger partners to work together. However, such relationships and especially trust with external companies remain important to enable the necessary sharing of digital information. In SCM, there are several central aspects in which small and medium enterprises can considered different from large companies.

Compared to large companies, in SMEs (1) higher level of demand uncertainty and (2) type of SCM evolution different. Evolution is fueled by adoption of new technologies or diversification – which is hard reach SMEs. In response, supply chain partners can be used by SMEs to collect competencies outside the main competence of SMEs. This offers opportunities to SMEs to keep abreast of current technological developments, such as Industry 4.0. For SMEs that the business is not focused on IT, there may already be a gap between them and large companies. For example, the use of formal planning and control systems that support for SCM compared by Vaaland and Heide between SMEs and large enterprises. They find, for example, that within SMEs there is less demand for planning and

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control systems compared to large companies. In addition to the lower complexity of SMEs, they believe that their business is not will change a lot, whereas larger companies assume that business they will be much more technology driven in the future. This technology gap can cause SMEs a competitive disadvantage when handling their supply chain, especially for managing SCM. This gap can be reduced by increasing supply chain collaboration between SMEs and large enterprises. SMEs do not need build knowledge for new technologies themselves, because they can access new technologies through network collaboration. In the context of implementing Industry 4.0, digitization of some parts of SCM should be seen as an integral concept to open overall potential. For example, better information coordination between suppliers and production plants can also lead to better coordination between supply and production capacity. However, both concepts require digitization and evaluation data each from both, data from SCM across all partners and management production at the factory level.

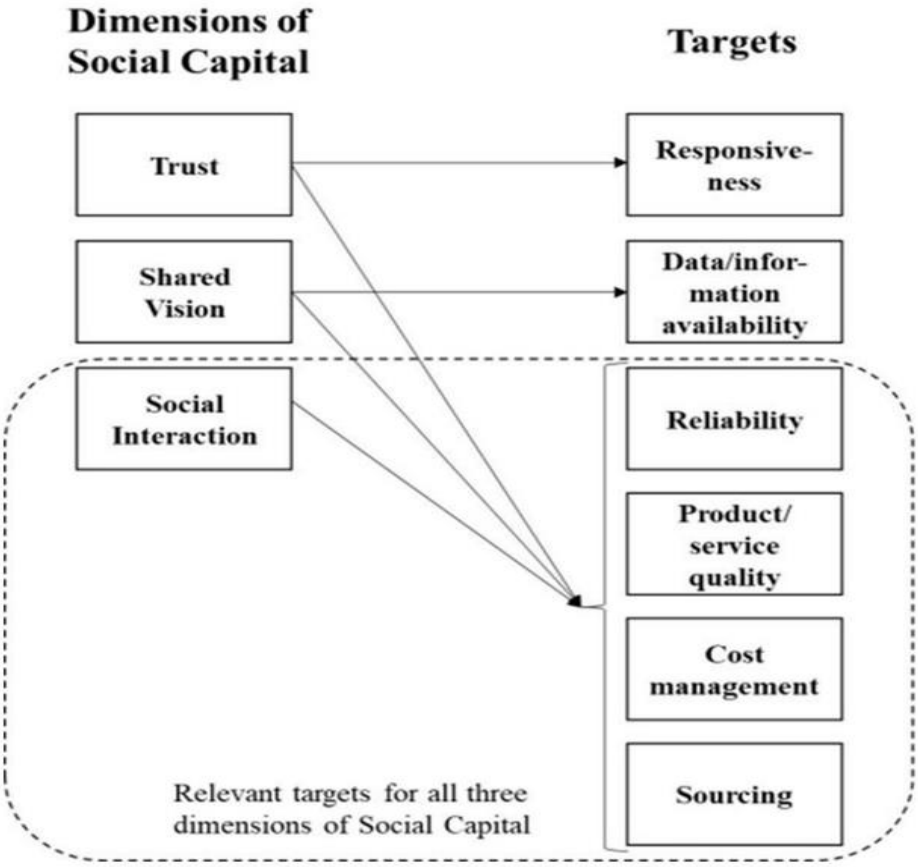

Figure 1. Stock level information as an example of availability differences between data from customers and suppliers.

Information Sharing Theory

Sharing information is an important topic to discuss considering that many previous studies have discussed this matter. Information sharing needs to be carried out by companies because it can assist in making a decision or action related to meeting consumer needs, dynamic consumer demand every time makes companies really need updated and valid information. With quality, clear and transparent information, companies can avoid the bullwhip effect. The same thing was also reinforced by Ishak (2005) especially that MSMEs

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need to get information easily and quickly, both information on customer satisfaction through the production market and production factor markets. Information about the production market is needed to expand the marketing network for products produced by MSMEs. The research results of Kurniawan & Kusumawardhani (2017) show that information transparency between suppliers and MSMEs has a positive impact on company productivity. Lin et al. (2002) also stated that sharing information with partners in the supply chain can reduce uncertainty and improve services in fulfilling consumer orders. So that the high intensity of information sharing can improve the performance of the company's supply chain management. According to Chopra and Meindl (in Pujawan and Mahendrawathi, 2010) information must have several characteristics in order to be useful in making supply chain decisions:

1. Accurate Information, must describe actual conditions and can be trusted.
2. Exactly. Considering what information is appropriate and needed by the company.
3. Can be accessed when needed.

Supply Chain Theory

In producing and distributing products, business actors certainly need other parties, according to Pujawan and Mahendrawati (in Ariani, 2013: 133), all parties ranging from suppliers, manufacturers, distributors, retailers, to consumers each have an important role in creating a product. quality, cheap and fast, so that a new concept emerged, namely Supply Chain Management . Supply Chain Management has developed into a broad concept that covers all activities within the company, including marketing and company operations (Maryanto, 2005). In the supply chain process, it does not rule out the possibility of risks that can affect the flow of the supply chain so that it cannot run smoothly. To identify and anticipate risks that arise in the supply chain flow, a good risk management in the supply chain (supply chain risk management) is needed. Industries that can properly implement supply chain management and its risks can be a requirement for success or even survival in their industry (Mukhsin, 2017) . Supply chain management performance needs to be maintained by evaluating supply chain performance periodically, especially if changes are made to the chain structure. supply. By conducting an evaluation, the company will know better what to do so that the supply chain management performance in the company will be better in the future. The success of supply chain management performance is based on the level of trust and commitment of all parties in the supply chain (Kwon and Suh, 2004). In implementing an effective supply chain, companies must make suppliers part of the company's long-term strategy in meeting consumer needs with a variety of products, high product quality, reduced costs, and speed of market response (Heizer & Render, 2011: 453), so it can be concluded that the performance of supply chain management can help to determine the competitiveness of companies in meeting market demand effectively and efficiently.

Kwon and Suh (2004) state that the success of supply chain management performance is based on the level of trust and commitment of all parties in the supply chain. Relationships between suppliers, customers and companies must be managed properly. How can suppliers take responsibility for product quality, good long-term relationships with suppliers and customers, and so that product distribution from upstream to downstream arrives on time? to end users. In implementing an effective supply chain, companies must making suppliers a part of the company's long-term strategy in

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meet consumer needs with a variety of products, quality products costs, and speed of responding to the market (Heizer & Render, 2011: 453). From the description above, it can be concluded that the performance of supply chain management can helps to determine the competitiveness of companies in meeting market demand effectively and efficiently.

Industrial Revolution Theory 4.0

Industry 4.0 refers to the latest technological advances with the internet as supporting technology, so guidance and support is needed to alignment of business strategy and operations. Industry 4.0 readiness is explained in IMPULS Industry 4.0 readiness (2015) which is measured in 6 dimensions (strategy and organization, smart factory, smart operations, smart product, data driven services, employees) for indicates a company into 5 levels of readiness. Revolution development The current industry, has entered the fourth era, namely the industry 4.0. The Industrial Revolution 4.0 was introduced by Professor Klaus Schwab, marked with cyber-physical used by industry, virtual connectivity from all lines between humans, machines and data. Industry 4.0 is still visionary but a concept that realistic, including Internet of Things, smart manufacturing, and cloud based manufacturing. Industry 4.0 focuses on the integration of people to produce continuous improvement. [1]. The development of Industry 4.0 globally has an impact on Indonesia, the Ministry of Industry launched the Making Indonesia 4.0 strategy as a road map regarding Indonesia's strategy in the implementation of entering Industry 4.0 so that Indonesia can be competitive with other countries. One of Indonesia's national priority strategy 4.0.

MSME theory

The development of digital-based MSMEs is an alternative to saving MSME sector in the industrial revolution era 4.0. However, so far the government has The Ministry of Cooperatives and SMEs has tried to encourage digital transformation. In this way, the digital entrepreneurship ecosystem grows. In this context, Digital entrepreneurship is a form of business that takes advantage of sophistication digital technology, both processes and marketing of products and services. In other words, all types of businesses that sell their products online either using a website or applications are included in the realm of digital entrepreneurship. Use of e-application commerce and the use of social media in digital marketing including the realm digital entrepreneurship.

Thus, the future of digital entrepreneurship could be one sectors that will make a lot of positive contributions to strengthening the economy Indonesia. This can be traced from the strengthening role of information technology in the world business. Digital technology has changed all the character and nature of the entrepreneurial model more digital based (Nambisan, 2017). Especially social media in context The economy is increasingly opening up new business opportunities for the community in developing digital entrepreneurship model. If examined, digital entrepreneurship comes from the word "teknopreneur" which means "digital entrepreneur" from a combination of "technology" and "entrepreneurs". In general, the word "technology" refers to the practical application of knowledge knowledge used to run the industry, including; tool cr problem solving, and so on. While the word "entrepreneur" refers to a person or group that creates a business with the courage to bear risks and uncertainties to achieve gains by identifying existing opportunities. This

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identification further confirms the entrepreneurial phenomenon digital will give birth to many opportunities for the public to start entrepreneurship especially at the MSME level.

This can be tracked because the digital entrepreneurship model has a lot to offer solutions in the form of convenience and comfort at lower prices and rates. However, a digital entrepreneur is not enough to have one or two capitals ability in the field of technology, but also must care about technological innovation supported by the discovery of creative ideas. That is, business development in the field technology still has to involve many actors, such as creative idea owners (entrepreneurs). digital), research centers, capital providers and the government. Citing Chayapa & Cheng Lu's study (Permadi, et al, 2108) states that there are several influencing factors a person's decision to shop online shopping namely;

1. Convenience. This factor is important considering that most people are trying to avoid it crowds to jostling when shopping in shopping centers. With thus the choice to shop at online shopping is a new alternative that can be make more effective.
2. Complete information. The presence of information technology makes access to information so fast and easy. This is coupled with the many platforms that has provided a variety of information, rating and review features to provide reviews about the quality and information of a product.
3. Availability of products and services. Only by accessing the website, people can quickly find out the availability of goods without having to visit the store. It can also help potential buyers who are located far from the store, if not need to visit but can still buy things online.
4. Cost and Time Efficiency. Several websites often offer to potential buyers the best price by comparing prices in several stores at once. Comparison This price becomes meaningful to potential buyers. Moreover, the online shopping model can done anywhere and anytime. In other words, the digital entrepreneurship model will encouraging the creation of new innovations so as to create a new ecosystem for MSMEs that can increase the productivity and welfare of the Indonesian people. Besides that With this technique, MSME actors will continue to be motivated to use technology network to market their products. The excesses of MSMEs will be able to do it soon adapt to the digital world which can then compete in the international arena.eation, skills development,

METHOD

In this study, explanatory research was used with the approach is quantitative using a questionnaire method. The location of this research is located in Temanggung Regency. The population in this study are all MSME actors Temanggung Regency.

RESULTS AND DISCUSSION

a. Information Sharing Information sharing is defined as willingness companies to share strategic data such as inventory levels, forecasts, sales promotions, and marketing strategies in forming supply chains (Cao and Zhang, 2011).

The indicators are:

1. Information disclosure (Zelbst et al., 2010);
2. Information Flow;

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3. Quality of Information (Chang et al., 2013).

b. Trust Trust is defined as a company's willingness to cooperate and depend on other parties (Chen et al., 2011). The indicator is :

1. Honesty of suppliers;
2. Supplier responsibility;
3. Supplier experience (Panayides and Venus Lun, 2009).

c. Long Term Relationship Long term relationship is a perceptions about the company's need for raw materials, information, and relationship with suppliers, so that it is expected to bring mutual benefits in the long term (Ganesan in Indriani, 2006). The indicator is :

1. Maintenance of relationships with suppliers (Prajogo and Olhager, 2012);
2. The advantage of having a long-term relationship;
3. Focus on long-term goals (Ganesan in Indriani, 2006).

d. Collaboration Collaboration is a business process in which two companies work together to plan, implement, and create a supply chain effectively and efficiently in order to achieve common and mutual goals profitable (Cao and Zhang, 2011).

1. Troubleshooting advantages;
2. Supplier involvement;
3. Supplier competence (Gallear et al., 2012).

Analysis results

Validity test

X1 Information Sharing

correlations

		X1.1	X1.2	X1.3	X1.4	I. SHARING
X1.1	Pearsons Correlation	1	.074	.435	-.227	.653**
	Sig. (2-tailed)		.604	001	.106	.000
	N	52	52	52	52	52
X1.2	Pearsons Correlation	.074	1	-.104	.271	.506**
	Sig. (2-tailed)	.604		.463	052	.000

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	N	52	52	52	52	52
X1.3	Pearsons Correlation	** -.104	.435	1	.017	.644 **
	Sig. (2-tailed)	001	.463		.906	.000
	N	52	52	52	52	52
X1.4	Pearsons Correlation	-.227	.271	.017	1	.405 **
	Sig. (2-tailed)	.106	052	.906		003
	N	52	52	52	52	52
I. SHARING	Pearsons Correlation	.653 **	.506 **	.644 **	.405 **	1
	Sig. (2-tailed)	.000	.000	.000	003	
	N	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

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X2 Supply Chain Management

correlations

		X2.1	X2.2	X2.3	X2.4	SCM
X2.1 Pearson	Correlation	1	057	-.559 **	.247	.363 **
	Sig. (2-tailed)		.687	.000	077	008
	N	52	52	52	52	52
X2.2 P arson	Correlation	057	1	.125	.181	.671 **
	Sig. (2-tailed)	.687		.375	.200	.000
	N	52	52	52	52	52
X2.3 Pearson	Correlation	-.559 **	.125	1	024	.295 *
	Sig. (2-tailed)	.000	.375		.865	.034
	N	52	52	52	52	52
X2.4 P arson	Correlation	.247	.181	024	1	.709 **
	Sig. (2-tailed)	077	.200	.865		.000
	N	52	52	52	52	52
SCM P earson	Correlation	.363 **	.671 **	.295 *	.709 **	1
	Sig. (2-tailed)	008	.000	.034	.000	
	N	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

Y UMKM
correlations

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		Y1.1	Y1.2	Y1.3	Y1.4 UMKM	
Y1.1 Pearson	Correlation	1	.265	-.024	.202	.503 **
	Sig. (2-tailed)		057	.867	.151	.000
	N	52	52	52	52	52
Y1.2 Pearson	Correlation	.265	1	-.221	-.250	.144
	Sig. (2-tailed)	057		.115	.074	.309
	N	52	52	52	52	52
Y1.3 Pearson	Correlation	-.024	-.221	1	.074	.734 **
	Sig. (2-tailed)	.867	.115		.604	.000
	N	52	52	52	52	52
Y1.4 Pearson	Correlation	.202	-.250	.074	1	.471 **
	Sig. (2-tailed)	.151	.074	.604		.000
	N	52	52	52	52	52
UMKM	Pearsons Correlation	** .144	.503	.734 **	.471 **	1
	Sig. (2-tailed)	.000	.309	.000	.000	
	N	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the results of the validity test conducted on 61 respondents, it has it is known that the results of calculations in the table of validity test results show that all items in each the indicator has a significance < 0.05 (ÿ = 5%) and has a value of r count ÿ r table that is equal to 0.3. Therefore, it can be concluded that all of these items valid and can be used to measure research variables ÿ 0.6. Therefore, it can be concluded that all variables are declared reliable.

Normality test

The normality test is carried out to test whether the dependent and independent variables in the regression method has a normal distribution or not. In this research data normality testing is done by looking at the probability plot. Probability test results The plot is presented in the following figure:

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One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		52
Normal Parameters a,b	Means	.0000000
	std. Deviation	1.13056648
Most Extreme Differences	absolute	.167
	Positive	.134
	Negative	-.167
Test Statistics		.167
asymp. Sig. (2-tailed)		.001c

a. Test distribution is Normal. b. Calculated from data. c. Lilliefors Significance Correction.

It can be seen that this proves that in the regression model in this study the data residuals have a normal distribution, so the regression model in this study has meet the assumption of normality.

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Multicollinearity Test

Coefficients a

Model	Unstandardized coefficients		Standardized Coefficients	t	Sig.	correlations			Collinearity Statistics	
	B	std. Error	Beta			Zero-order	partial	Part	tolerance	VIF
1 (Constant)	13,872	2,931		4,733	,000					
I. SHARING	040	.147	.039	.272	.787	.037	.039	.039	.995	1.005
SCM	-.024	.159	-.021	-.148	.883	-.018	-.021	-.021	.995	1.005

a. Dependent Variable: MSME

a. Dependent Variable: MSME

it can be seen that the Tolerance Value of information sharing = 0.787, supply chain management = 0.883, it can be seen that all these variables are more than 0.1. As for the Variance Inflation Factor (VIF) value from the formation division = 1.005, supply chain management = 1.0005, the VIF value of this variable is less than 10. This shows that the regression model in this study has no correlation high between the independent variables or the assumption of free correlation in the model is met

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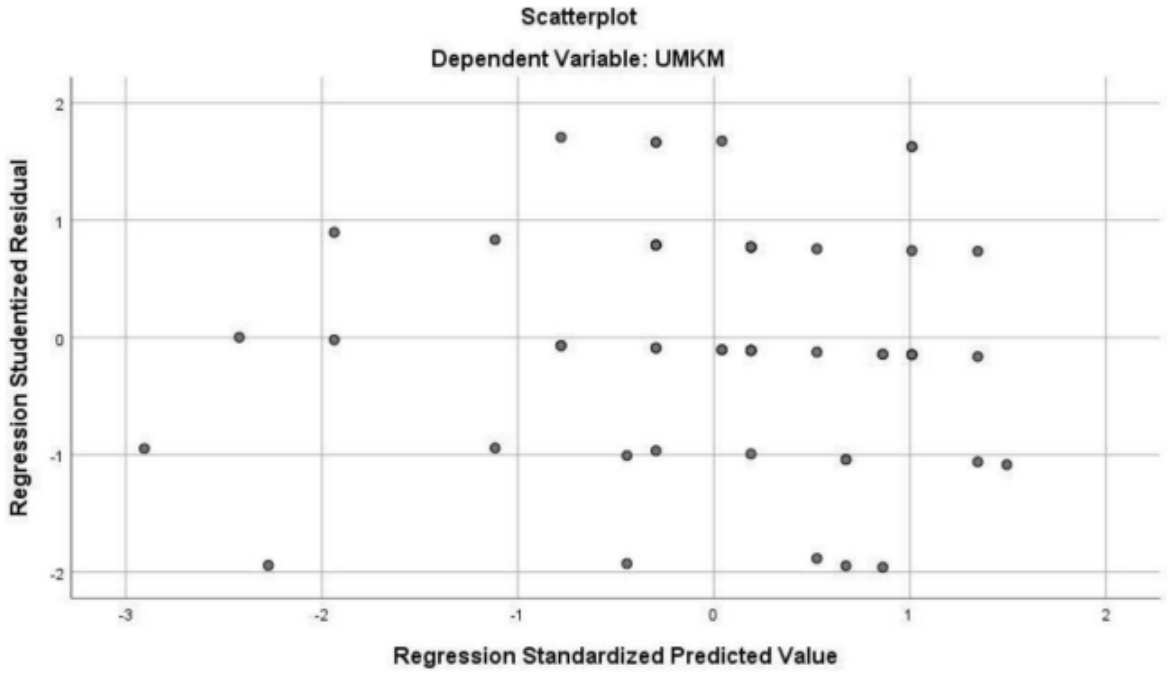
Hetero Test



Based on the results of the analysis as in the table above, it can be seen that each each variable has a significant value then, it can be concluded that each variable does not contain heteroscedasticity, so it fulfills requirements in the regression analysis

CONCLUSION

The results of the analysis and discussion that have been carried out in the previous section as well In relation to the research objectives, several conclusions are obtained as follows
following :

1. Information sharing has no significant effect on supply performance
   Chain Management. Performance of Supply Chain Management can be high in both companies strong in sharing information or not. There are a number of other determining factors which contribute more strongly in determining the performance of Supply Chain Management.
2. Long-term relationship has a positive effect on supply performance
   Chain Management. Supply Chain Management performance will be higher if long-term relationship owned by the company is getting wider.

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