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Drop-Shipping Supply Chain: The Characteristics of SMES Towards Adopting it

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Abstract: Malaysian Small Medium-sized Enterprises (SMEs) have always been the largest provider to the economic development of the country. However, limited studies have been conducted within the field of drop-shipping supply chain. Therefore, the main aim of this study was to provide insights into Malaysian small-medium enterprises' characteristics which influenced the adoption of drop-shipping supply chain into their management. Data were collected through questionnaires from several business sectors of SME located in all over Malaysia. The findings specify that there was a highly positive correlation between the variables: organizational structure, organization strategy and firm's strategy towards the adoption of drop-shipping supply chain. The significant findings of this study showed that characteristics of SMEs highly contributed to the adoption level of drop-shipping. Hence, the outcomes of this study support the proposed framework and confirm that they indeed contribute to the adoption of drop-shipping supply chain by the SME.

Key words: Drop-shipping, small-medium enterprises, sustainable innovation, supply chain, strategy

INTRODUCTION

With the rapid growth of online business now a days, there are emerging needs for SME to improve their sales performances by using the Internet. One of the popular techniques is called drop-ship. Drop-ship can be described as a supply chain management technique where the retailer does not keep any products in their stocks. Instead, they transfer customer orders and shipment details to the manufacturer or wholesaler who then ships the products directly to customers.

The use of the drop-shipping platform has become more popular in the last decade with the increase of e-commerce in Malaysia. This technique is a good business model for manufacturers and retailers who wish to expand their business. Suppliers will be concentrating on manufacturing and shipping while retailers will only focus on sales and customer services. This is an advantage for both manufacturers and retailers. However there has been limited research conducted on drop-shipping. The key aim of this research is to study the characteristics of SMEs that affect the adoption of drop-shipping supply chain in Malaysia. This research focuses on the organizational size and structure, corporate strategy and managerial attitudes. Based on the research by Khouja, the application of drop shipping to fulfill demand among e-retailers has been one of the main benefits of doing business especially through the information communication technology. The output of this research sheds added knowledge and better understanding about the adoption of drop-shipping method which is an innovative supply chain that can be applied by Malaysian SMEs.

Problem statement: Currently, Small and Medium Enterprises (SMEs) have attracted the attention of academician and practitioner as they have realized the significant contribution made by the SMEs towards nation's growth. According to a study, they found that SMEs contribution to Asia's Gross Domestic Product (GDP) is as high as 30-60% and employment opportunities of between 40-80% of the workforce (Chong *et al*., 2014). This includes SMEs that are doing online business.

In the Malaysian context, there is no doubt that SMEs play a crucial role to the development of Malaysian economy. Unfortunately, their contribution towards national economy is still considered small. According to the chief executive officer of SME Corp, Datuk Hafsah Hashim, this problem occurred due to the variety of challenges and circumstances that prevent SMEs to further expand their business such as the rising cost of raw material, the increasing overhead cost, cashflow restraints and inablity in finding access to the financing and working capital.

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In order to overcome these issues, SME Corp has formulated some key strategies to help SME continue their success in business, including incorporating innovation in their organizations. Hence, a proper and appropriate innovation will help SMEs to grow their business.

Now a days, there is a rapid increase of business interest in building sustainable organizations (Pfeffer, 2010). Just like big companies, SMEs are also looking forward to ensure their capabilities sustain in the industries. With today's technologies and the rise of social media marketing, SMEs can now easily enter the business industries and penetrate the market share. The gap and limitations for them to compete with each are now very small. Everyone can start their own business anytime and anywhere. This however has led SMEs to another issue; the number of competitors now have doubled or even tripled.

SMEs in developing country like Malaysia have begun to focus on having efficient supply chain and operations. One of the popular type of supply chain that is used by SMEs today is online business supply chain. There are lot of research and studies that have been done in the field of online business in Malaysia. However, the concept of adopting drop-shipping supply chain is rather scarce. Hence, this study leads to an insight towards the characteristics of SME that will most likely to adopt drop-shipping into their supply chain system.

Literature review

Definition of drop-shipping supply chain: Based on Lieber and coauthors, drop-shipping happens when retailers send orders to wholesalers who then ship the order directly to the customer in which it reduce the need for a retailer to handle inventory and trim down distribution costs. This would highly depend on how effective the communication speed is within the supply chain from wholesalers, retailers, to consumers. Unlike traditional retailers, drop-shipping is different from the usual supply chain management where the wholesaler is in charge of the inventory management for retailers (Katircioglu *et al*., 2014). Drop-shipping differs in the sense that retailers do not hold nor manage the inventory but only sell while wholesalers hold the inventory and distribute the products on behalf of the retailers.

One of the biggest differences of drop-shipping from traditional retailing is selling on the Internet and it is only based on goods flow and information flow within the supply chain. In traditional retailing, physical store is needed where a customer would select products and pays for it at the same time and location at that moment when the customer physically receive the product (Heizer *et al*., 2014).

Small-Medium Enterprises (SME) in Malaysia: In this challenging era, a Small-Medium Enterprise (SME) has become focal point of interest for researcher and academician. They are now an important entity that should not be neglected. This is because they have significant contribution towards economic development the country. SMEs play an important role in the Malaysian economy. Based on the report of the Malaysia Economic Census, it showed that there were 645,136 SMEs running in Malaysia, which also represents 97.3% of total business establishments. Besides that, SMEs employ about 3.7 million out of total 7.0 million workers amounting to 52.7% of total employment in the country. From a total share of gross output that has achieved 28.5% in 2011, compared to only 22.2% in 2000, this proven that the significance of SMEs are growing from year to year.

E-commerce adoption: Drop-shipping supply chain has a close relationship with the adoption of e-commerce. Most of the drop-shipping process occurs in e-commerce environment. Specifically for this study, we have taken Grandona's and Pearson's definition of e-commerce as "the process of buying and selling products or services using electronic data transmission via the Internet and the www." The mere use of electronic mail or the use of a web site for electronic publishing purposes does not constitute e-commerce according to the definition above. From the findings of Khouja, many e-commerce retailers especially SME has been using drop-shipping to satisfy demand in the Internet since the last decade.

Technology-Organization-Environment (TOE) framework: Three aspects of an organization's context have been indentified that affects its adoption of technological innovation which are technological context, organizational context and environment context. Based on Technology-Organization-Environment (TOE) framework that developed by Tornatzky and Fleischer, technological context has divided into two which are existing technologies and technology to be adopted. The main purpose of technological context is about how technological characteristics able to lead to the adoption to occur. On the other hand, the organizational contexts illustrate the factors of organization that will either restrict or assist the adoption of technological innovations. Meanwhile in the external environmental context is about the area of the industry, competitors, regulations, supplier's access and also involvement with governments. In the context of Malaysia, the challenges

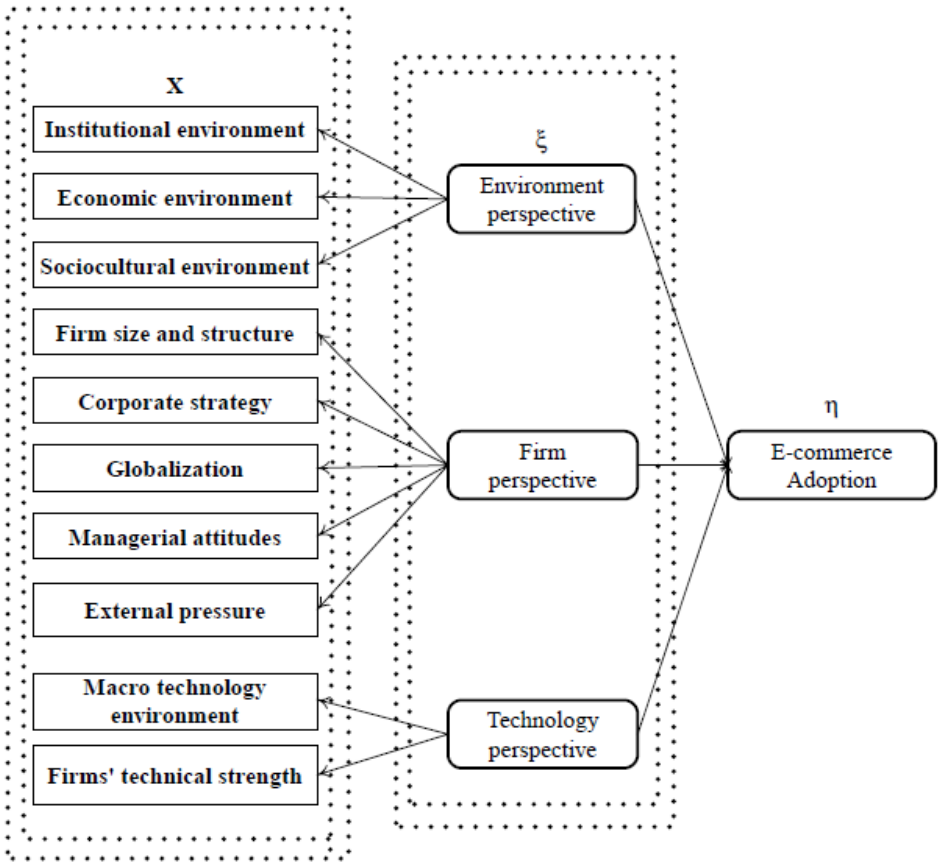

Fig. 1: The e-commerce adoption roadmap

of organizations to go green were discussed by Musa *et al*. (2015) in the area of skilled worker and the economics of scales. According to their research, the most challenges faced by organizations are in resource availability including financial, human and time (Musa *et al*., 2015).

Based on the TOE framework that was created by Li and Xie (2012) in Fig. 1, it shows that TOE was formed as a comprehensive framework specifically for e-commerce adoption and categorized into three categories; environment perspectives, firm's perspectives and technology perspectives. In this research, the study is related to SME characteristics; hence the firm perspective has been selected to become the center of research interest in which its component will be chosen as the variables for this study.

Firms perspective as the characteristics of SME: One of the main aims of the organisational innovation literature is to identify organisational characteristics that influence adoption of an innovation within the organisation. Based on the e-commerce adoption roadmap (Li and Xie, 2012), the characteristics that exist in firms perspective are firms size and structure, corporate strategy, globalizations, managerial attitudes and external pressures. However, in terms of Malaysian SMEs perspective, they are more centred on local market and firms internal factors. Hence, this study will eliminate the other factors relating to globalizations and external pressures. Considering all the above characteristics we have finalized three SMEs characteristics that will be examined in this research; organizational size and structure, corporate strategy and managerial attitudes.

Organizational strategy: Trott presented an overview of the key elements to business strategy which include: long term aspirations of organisation and management that will impact eventual strategy, organisation's capability in terms of skills and resources of people, etc. and the operating environment where organisations compete such as technological developments, competitors and changing market condition. Patterson and coauthors agreed that in

order to achieve something, organisations' structure and the management process should line up with the firms in order to make changes in the external environment and also firm strategy.

Organizational size and structure: Cartman and Salazer (2011) described organisational size as a proxy variable that gives dimensions in terms of economic and organisational resources which include number of employees and their scale of operations. A small business is indicated to have <20 employees significantly differs in term of resources compared to organisation with 200-2000 employees (larger organisation). Some studies argue that larger companies will tend to adopt innovations due to their capability to access resources (Musa, 2014), while some reported that there is no significant association between size of company and adoption of innovation. The type of business SMEs are running may determine whether or not the innovation will be adopted in the organisation. Wang and Wu (2012) who studied the interaction between a firms business type and industry value chain found a positive relationship on the organisations operating performance.

Managerial behaviors: Many studies consider manager's support as a key determinant to the adoption of innovation. Top management support is one of the motivating ways for employees to positively adopt innovation (Musa *et al*., 2015). This is because the manager possesses power and authority as they are a key to the decision-making process. Kuratko *et al*. (2014) asserted that decision makers (the management) play important roles in innovation as they will choose whether or not the innovations is selected (to innovate or not) or to decide what methods of implementation to be used. Kuratko *et al*. (2014) described someone who is in a super ordinate power position within the organisation (the boss) as "Authority innovation-decisions". Managers influence the decision in adopting innovation. Further, managers decide and anticipate the requirements of skills of staff for a new technology to match with the existing system.

Research hypothesis:

- H_1: Type of the SME's business is positively related with the adoption of drop-shipping supply chain
- H_2: SME's organization strategy is positively related with the adoption of drop-shipping supply chain
- H_3: The managerial behaviours is positively related with the adoption of drop-shipping supply chain

MATERIALS AND METHODS

This research is intended to identify the characteristics of SMEs that affect the adoption of drop-shipping supply chain in their business. The research focuses on three SMEs characteristics; organizational structure, organizational strategy and managerial behaviours. For this research, a survey strategy had been undertaken as suggested by previous literature conducting similar studies. In order to effectively conduct this research, the methodology involves several components which are formulated hypotheses, design selection, method of data collection, population determination and sample assortment, questionnaires and few methods of data analysis. It is important for the researcher to design a methodology for the issue that has been found. It should be noted that even if the method considered is similar to others, the methodology would be different. It is necessary for the researcher to understand that the right methodology matters in order to form a good result for the research. In this study, 300 samples have been selected from different type of business which consists of services, manufacturing, constructions, agricultures and others (Wholesale/Retail) that are located in Malaysia.

RESULTS AND DISCUSSION

Results are presented in to understand the relationship between the adoption of drop-shipping supply chain and SME characteristics (organizations structure, organizations strategy and managerial behaviour). The results provide the SMEs characteristics that affect the adoption of drop-shipping supply chain in their business.

Respondents' background: In this study, the SMEs' responses have been analysed to obtain their profile such as business sectors, age of the company, number of employees and estimated annual profit. This section also analyzes the implementation of drop-shipping supply chain in the company and whether it is implemented or not.

Business's sectors: Based on Table 1, it shows that majority of the respondents are from the manufacturing sector, with 53% of the whole number of respondents. This is followed by other sectors (all of them are from wholesale/retail business) with 37% of the whole respondents and Services sectors (10%). However, there are no respondents that came from Agriculture and Construction sectors.

Table 1: Type of business

Answer options	Response (%)	Response count
Services	10.0	15
Manufacturing	53.3	80
Constructions	0.0	0
Agricultures	0.0	0
Other (wholesale/retail)	36.7	55
Answered questions	-	150

Table 2: Number of employees of SMEs

Answer options	Response (%)	Response count
<5	8.7	13
5-50	87.3	131
51-150	4.0	6
Answered question	-	150

Table 3: Age of firms

Answer options	Response (%)	Response count
<5 years	53.3	80
5-10 years	45.3	68
11-15 years	0.7	1
>15 years	0.7	1
Answered question	--	150

Table 4: Estimated annual gross profit

Answer options	Response (%)	Response count
<RM 300,000	64.7	97
>RM 300,000	26.7	40
<RM1 millions	8.7	13

Respondent's number of employees: Based on Table 2, it shows that majority respondent's number of employees is between 5-50 people (87%). This is followed by <5 employees (9%) and 51-150 employees (4%).

Age of firms: Based on Table 3, it shows that majority respondents' firm age are <5 years old with 53% of the whole number of respondents. This is followed by 5-10 years old (45%), 11-15 years old (1%) and > 15 years old (1%).

Estimated annual gross profit: Based on Table 4, it shows that majority respondents estimated annual gross profit is <RM300, 000 which represents 64% of the whole respondents. This is followed by those who earned >RM300,000 annually (27%) and >RM1 million (9%).

Adoption of drop-shipping system

Validity and reliability test

Validity test: Validity is a test that measures the extent of what it is theoretically to measure. It is one of the most important criteria to identify the value of a test. Three question of validity is raised which are the form of the test, the purpose of the test and the population for whom it is intended. Validity will evaluate the accuracy of the question in the questionnaire whether it was understood by the respondent or otherwise. From validity test, we can also find out the significance of the questions. A good validity of test will shows the items that are closely connected to the test's intended focus. If the result of validity test is poor then it means the measure does not measure the job-related content and competencies as it should be. When this happens, then there is no justification for using the test results for their intended purpose.

Table 5: Adoption of drop-shipping system

Answer options	Response (%)	Response count
Yes	58.7	88
No	41.3	62
answered question	--	150

Table 6: Reliability statistics

Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
0.995	0.995	3

In this research, the draft of the questionnaire was developed with questions drawn from the literature and also by referring to other previous studies that have very close research objectives. By referring to the questionnaires from the previous studies, there was minimal opportunity for miscomprehension (Table 5).

Reliability test: According to Cooper and Schindler, reliability defined as the degree of steadiness of results and to which extent the measurement is free of random and unstable error. DeCoster recommended that Cronbach's alpha is the best reliability estimator. To confirm the internal consistency and reliability of measures, Cronbach's alpha has been applied to analyse for the individual scales. Based on Sekaran, Cronbach's alpha is also known as reliability coefficient that shows how good the items in a set are positively related to one another. It is also calculated in term of the average inter-correlations among the items that evaluate the concept. A Cronbach's alpha value of >0.6 would means that it has an adequate reliability (Mei *et al*., 2007).

Table 6 shows that the Cronbach's alpha for the items under the independent variables. As mentioned previously, the main purpose of this test is to check whether the data obtained is reliable or not. The rule of thumb for the reliability test is that 0.7 and above represents good reliability. Based on the result in Table 6, the Cronbach's alpha for all variables are acceptable and considered reliable as the results is 0.995.

Correlation analysis: Correlation refers to synonym for association or the relationship between variables. It measures the degree to which two sets of data are related. In other words, the purpose of correlation analysis is to

Table 7: Correlations

Test	Drop-ship adoption	Organizational structure	Innovation strategy	Managerial behavior
Drop-ship adoption				
Pearson Correlation	1	0.987**	0.987**	0.975**
Sig. (2-tailed)		0.000	0.000	0.000
N	150	150	150	150
Organizational structure				
Pearson Correlation	0.987**	1	0.982**	0.974**
Sig. (2-tailed)	0.000		0.000	0.000
N	150	150	150	150
Organization Strategy				
Pearson Correlation	0.987**	0.982**	1	0.998**
Sig. (2-tailed)	0.000	0.000		0.000
N	150	150	150	150
Managerial behavior				
Pearson Correlation	0.975**	0.974**	0.998**	1
Sig. (2-tailed)	0.000	0.000	0.000	
N	150	150	150	150

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

Table 8: Model summary

Models	R	R^2	Adjusted R^2	SE of the estimate
1	1.000[a]	0.999	0.999	0.17276

[a]Predictors: (constant), organizational structure, innovations strategy, managerial behavior

see if there is a change in the independent variables will result in a change to the dependant variables. Higher correlation value indicates the stronger relationship between both sets of data. When the correlation is 1 or -1, a perfectly linear positive or negative relationship exists. However, if the correlation is 0, it implies that there is no relationship between the two sets of data. Coetzee noted that when considering the correlation between the independent variables (organizational structure, organization strategy and managerial behaviors) and the dependent variable (adoption of drop-shipping supply chain), the larger the magnitude of the correlation, the stronger the linear association. The standard correlation coefficient is Pearson's r which applies primarily to variables distributed more or less along interval or ratio scales of measurement.

Table 7 presents the inter-correlations among the variables being explored. From the analysis it is noted that adoption of drop-shipping supply chain is positively and highly correlated with all independent variables; organizational structure ($r = 0.987$, $p<0.01$), organization strategy ($r = 0.987$, $p<0.01$) and managerial behaviour ($r = 0.975$, $p<0.01$). It is evidence that the dependent variables (adoption of drop-shipping) were highly-correlated with all the independent variables that has been taken into measure in this study.

Regression analysis: Regression is defined as the value of association level between two independent variables. This type of statistical test is only able to happen with either interval or ratio data. It is possible to form a straight line through the resulting points in a way that reduce the distance between the points that was measured if the actual data of an independent variable and dependent variable being placed on the two axis of a graph. The resulting line which is also known as the regression line can be measure in the form of straight line or curve. From multiplying the value of independent value using regression coefficient enable the researcher to predict the value of dependent variable. It could help in terms of value prediction; if you know one variable, it would mean how well you can predict another one. To measure the direct effect hypotheses, the dependent variable was first regressed onto the characteristics of SME variable.

Table 9: Coefficients

	Unstandardized coefficients		Standardized coefficients		
Model (1)	B	SE	β	t-values	Sig.
(Constant)	2.146	0.334	-	6.433	0.000
Organizational structure	0.376	0.089	0.327	4.207	0.000
Organization strategy	0.674	0.052	0.746	12.947	0.000
Managerial behavior	-0.356	0.063	-0.296	-5.857	0.000

[a]Dependent variable: Dropship_adoption

From the result obtained by using Linear Regression Analysis, a value of R = 1.00 indicates a good level of prediction. $R^2 = 0.999$ implies that the independent variables (organizational structure, organization strategy and managerial behaviour) explain 99% of the variability of the dependent variable (adoption of drop-shipping). Based on the result, it shows in Table 8 the perfect model where R^2 = Adjusted $R^2 = 1.0$. Results from the regression model are presented in Table 9. The regression models in the table are used to test the direct relationships between the adoption of drop-shipping among SME in Malaysia with the independent variables. These analyses show that the adoption of drop-shipping among SME in Malaysia is positively influenced by organizational structure ($B = 0.376$, $p<0.05$) and organization strategy ($B = 0.674$, $p<0.01$). On the other hand, managerial behavior ($B = -0.356$, $p<0.05$) was found to negatively influence the adoption of drop-shipping in the SME company. Thus, all three hypotheses H_1-H_3 were accepted. The relationship between the dependent variable and independent variables can be denoted by the following equation:

$$Y_{\text{adoption of dropshipping}} = 2.146 + 0.376_{\text{org.structure}} + 0.674_{\text{org. strategy}} - 0.356_{\text{man.behavior}}$$

It can be concluded that the firm's strategy is the most factor that contributes to the adoption of drop-shipping in the SME company compared to the other independent variables (organizational structure and managerial behavior).

CONCLUSION

The research uses surveys as primary data collection method. The survey questionnaires are composed of a Series of questions about respondent (SME) general information and how the respondents reflect on the characteristics of their company towards the adoption of drop-shipping supply chain. The questionnaires were distributed to 400 SMEs. However, only 150 were returned and deemed as useful data. At first, we are targeting the respondents from various business sectors in Malaysia. However, majority of respondents that have given the feedback were only from three sectors; Manufacturing (53%), Others (wholesale/retail -37%) and Services (10%). All respondents are relevance to answer these questionnaires.

This research provides a better understanding on how the characteristics of the SME affect the adoption of drop-shipping in the company. Generally, there are few characteristics of SME that can affect the adoption of drop-shipping supply chain. However, only three variables are taken in this study to represent the characteristics of SME towards the adoption of drop-shipping supply chain which are organizational structure, organization strategy and Managerial Behaviours. Various approaches have been used in finding answers of objectives that stated in the research such as distributed the questionnaire as well as some of the methods used to analyse the data obtained.

This study has revealed the existence of significance relationship between SME's organizational structure and the adoption of drop-shipping supply chain. The regression analysis has interpreted a moderate positive correlation between organizational structure and the adoption of drop-shipping supply chain. According to this analysis, the result show there is significant relationship between independent and dependent variable of this study which indicate the R-value as 0.376. According to this result, it can be interpreted that there is moderately positive correlation between organizational structure and the adoption of drop-shipping supply chain. In the other words, the first hypothesis of this study, "There is a relationship between organizational structure and the adoption of drop-shipping supply chain" is positively supported.

Besides that, it can also be concluded that there is a significant relationship between the SME's organization strategy and the adoption of drop-shipping supply chain. Based on the analysis, theresult show there is significant relationship between independent (organization strategy) and dependent variable (adoption of drop-shipping) of this study which indicate the R value as 0.674. According to this result, it can be interpreted that there is a moderately positive correlation between firm's strategy and the adoption of drop-shipping supply chain. In the other words, the second hypothesis of this study, "There is a relationship between organization strategy and the adoption of drop-shipping supply chain" is positively supported.

More from the analysis, it can also be concluded that there is a significant relationship between the SME's managerial behaviours and the adoption of drop-shipping supply chain. Pearson correlation analysis shows that there is a negative relationship between managerial behaviours and the adoption of drop-shipping supply chain which indicate the value of R as -0.356. According to this result, it can be interpret that there is a negative correlation between managerial behaviours and the adoption of drop-shipping supply chain. This means that the third hypothesis "There is a relationship between managerial behaviours and the adoption of drop-shipping supply chain" is supported. It means that the adoption of drop-shipping supply chain in the SME can reduce the issue on managerial behaviours.

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