Supply Chain Management in Small and Medium Enterprises: SCM Practices

Nurchayati[1], Supramono[2], Intiyas Utami[3], Hari Sunarto[4]

[1]*Universitas Kristen Satya Wacana, Program Doktor Ilmu Manajemen, Jl. Diponegoro 52-60, Salatiga 5077 Jawa Tengah, Indonesia*

nurchayatiatik@gmail.com; supramono@staff.uksw.edu; intiyas.utami@staff.uksw.edu; hari.sunarto@staff.uksw.edu

Abstract— **Supply chain management (SCM) in small and medium-sized enterprises is aimed at ensuring both short- and long-term effectiveness and efficiency of these enterprises. Small and medium enterprises (SMEs) potentially make irrational decisions because of their individual limitations. Specifically, they are subject to biases, including SCM and escalation of commitment. This study investigates the causality of the interaction between SCM and experience and escalation of commitment in SMEs. This paper used a 1x2 laboratory experimental design with 69 subjects of SME owners who produced pressure-cooked milkfish in Semarang City, Central Java, Indonesia. The independent variable was SCM that consisted of two levels (high vs. low self-attribution). Business age was the proxy of experience as the mediating variable. Meanwhile, the dependent variable was escalation of commitment that was measured with investment decisions. The information on SCM was the new product development opportunity of milkfish meatball. Subjects with high SCM were informed that they had a good ability to coordinate with suppliers to develop the new products while those with low SCM were informed on the presence of the uncertain economic condition and bad luck. One-way ANOVA tested the effectiveness of randomization while independent sample test and univariate analysis of variance tested the hypotheses. The study shows that SME owners with a high self-attribution exhibit greater escalation of commitment than those with a low self-attribution. This paper also empirically finds that the interaction between SCM and experience increases escalation of commitment. By demonstrating that SCM likely affects SMEs' investment decisions, this study advises governments to take entrepreneurs' behavioral aspects into account when advocating SMEs. The financial behavior literature on escalation of commitment largely focuses on large firms in their analysis. Meanwhile, the existing phenomena show that decision-making processes in SMEs also exhibit escalation of commitment. This study investigates escalation of commitment in SMEs' investment decision making regarding SCM and experience in running businesses.**

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1. Introduction

A supply chain encompasses all participants and processes, from the raw material manufacturers to the end users. The classical view of the supply chain includes four basic components: procurement, warehousing, production and distribution. The contemporary approach requires precise forecasting and demand planning which link supply and demand in such a way as to ensure that the right product is to be found at the right place at the right time. If movement of raw materials, semi-finished and finished products through the supply chain is in better compliance with the demand, the enterprise will decrease its stock, enhance its customer service, and avoid unpleasant surprises. SMEs contribute to 65% of Indonesia's Gross Domestic Product (http://www.kemenperin.go.id). Most SMEs are individually managed by their owners, who also act as managers and heavily rely on family employees. They also lack legal status [1]. SME owners are likely to exhibit biases in making investment decisions because of bounded rationality that is inherent in each person. Specifically, SME owners understand that their investment projects will potentially fail, but they decide to continue the investments. SMEs' behavior to continue potentially unprofitable investments is often called escalation of commitment [2]. Escalation of commitment involves continuous resource allocation to investments after decision-makers receive negative feedback on the performance of the investment [3]. Escalation of commitment to action refers to an irrational decision to allocate additional resources to potentially unprofitable investments with a negative future return prospect [4]. Entrepreneurs continuously add resources to investments that potentially fail, although they receive advice to discontinue the projects [5]. Consequently, entrepreneurs suffer economic losses that will harm their competitiveness and even lead to bankruptcy [6].

A factor that likely affects escalation of commitment is SCM [7]. SCM is a cognitive phenomenon where individuals tend to relate their successes with their internal strength and their failure with external factors [8-12]. In [13] find that SCM affects individuals' perception of their ability and shifts their focus from previous successes. When investors loss, it is likely that they commit more resources to the unprofitable projects and expect that the future performance of the projects to demonstrate that previous losses are only due to bad luck [14-20]. In the context of financial decisions, [16] show that SCM leads individuals to consider a higher level of their investments' previous returns as the sconsequence of their investment skills while external factors explain their investments' lower returns. Also, SCM affects individuals' ability to estimate their ability.

Individual experience strengthens the relationship between SCM and escalation of commitment [21]. Managerial experience plays an important role in decision-making behavior. In [22] indicate that individuals who are more experienced or familiar with their assignments are more willing to take risks in making decisions. However, less experienced individuals tend to be more cautious and less willing to take risks. In [23] demonstrate that experienced managers tend to continue their projects. However, [24] argue that managerial experience reduces errors in making decisions to increase commitment.

This study focuses on SMEs, while previous studies largely emphasize large firms. For example, [25] find that Chief Executive Officers (CEOs) with SCM attribute their firms' success with their ability while they associate firms' failure with the general economic condition. Further, [26] investigates 160 IT managers and finds that SCM increases managers' commitments to failed IT projects. Meanwhile, SMEs potentially make decisions that are affected by cognitive biases that may lead to escalation of commitment.

The paper aims to test the causality between SCM and escalation of commitment and the interaction of SCM and experience in affecting escalation of commitment. The study contributes to the behavioral finance research, especially on SCM in SME owners. A better understanding of psychological factors that underlie investment decisions helps reformulate their investment objectives. The findings also help governments as public policymakers to advocate SMEs through training and education that help SMEs mitigate escalation behavior.

2. Literature Review

Research Setting

This research uses the fish-processing SME owners' investment decisions to make a highly risky new product development. These entrepreneurs were informed that in early 2019, their firms decided to develop a new processed fish product that required a high amount of investment needs and offered an uncertain project success (a high-risk investment project). The condition that triggered escalation of commitment was high self-attribution. Specifically, subjects had beliefs and ability to coordinate with suppliers and put significant efforts to develop the new product. Meanwhile, subjects with low SCM received information that they believed in bad luck, and the economic condition was uncertain that might negatively affect the processed fish product development. The decision exhibits high escalation of commitment if the decisions makers launch the new product according to the initial schedule despite the existence of competitors and uncertain market condition. SME owners' experience also likely motivates escalation of commitment. This research uses the length of business activities as an indicator of experience. SME owners with longer business experience are more experienced and more likely to continue their investments despite the potentials of investment failure.

Prospect Theory

Escalation of commitment can be explained by prospect theory as introduced by [27]. The theory argues that individuals continue their investment plans, although they have sufficient knowledge that the investments offer a great loss potential. In [28] began to investigate behaviors that are considered odd and contradictory in making decisions by providing the same choices to two different subjects, and their results showed different behaviors. Based on prospect theory, individuals tend to avoid risks when decisions are positively framed and tend to seek risks when decisions are negatively framed [29]. Further, [30] proposes that prospect theory provides a psychological mechanism to explain increasing commitments to failed decisions without having to make self-justification. Individuals are likely to add more resources to ensure that their decisions are correct and successful.

If investments fail, SME owners may react to the failed investments differently. If they consider the investments to provide certain profits to them, no matter how little, they will discontinue the investments to avoid the risks. However, if they consider the investments to offer a likely great loss, they are likely to continue the investments because they are willing to take risks. Self-justification process is a part of individuals' commitment to their decisions and thus likely increases commitment [31]. The attitude explains why individuals increase their commitments to their previous investments; individuals make decisions that reflect their previous behaviors [32]. Individuals tend to remember and follow the information that fit their behaviors to create consistencies with their present and future decisions. Decision makers are motivated to compensate past losses and try to rationalize their actions or to psychologically defend their previous mistakes in assessments [33] hold that reliance on self-justification when loss exists will affect projects.

SME owners continue their investments even after they are informed that the investments not only offer returns below their expectations but also potentially fail. They tend to neutralize their behavior through self-justification, and they continuously show their commitment to justify their past decisions.

Attribution Theory

Attribution theory proposes a framework to understand how individuals interpret their behaviors and others'. This theory further emphasizes how individuals interpret events and how these interpretations are closely related to their thoughts and behaviors. Attribution theory was initially introduced by [34] and later developed by [35] whether their behaviors are attributed by external or internal factors. Internal attribution refers to the determinants of behavior that are associated with internal characteristics, such as ability and motivation [36]. Meanwhile, external attribution interprets ones' behaviors are affected by the situation where these individuals are located.

In the SME context, attribution theory can explain the causes whether SMEs' behaviors are caused by internal factors such as attitude, character, traits, or external factors such as situational pressure or certain conditions that affect their behavior. Also, this theory explains how SME owners react to existing events by highlighting the reasons for their reactions that further identify SME owners' attitude or characteristics.

Escalation of Commitment

Escalation of commitment is the individuals' tendency to continue potentially unprofitable investments. In [37] notes that escalation of commitment is decision makers' tendency to continue failed actions. Escalation of commitment explains why individuals decide to add their investments in money, time, and efforts, although their decisions are incorrect. Escalation of commitment refers to decision makers' behavior to sustain when the economic prospect is poor. In [12] argue that the escalation is an irrational decision to allocate additional resources to unprofitable projects and prospective future unprofitable returns. Further, [3] find that participants increase their commitments to failed projects when deciding whether they need to reinvest their funds to initial projects or choose other promising alternatives.

In making investment decisions, SME owners incur the risk their projects will inflict a loss or even fail. SME owners tend to neglect the information and continue their investments because they expect that the investments will generate profitable returns in the future. Furthermore, discontinuing their investments will erode their reputations that they tend to escalate their commitments.

Supply Chain Management in SMEs

Individuals regularly make attributes about themselves and others (Tine, 2013). SCM is defined as individuals' tendency to make attributes positive, stable, and global internal events instead of their attribution to negative events [7] define SCM as a pattern of attributing oneself to success than to failure. Individuals who are subject to SCM tend to relate favorable results with their ability and unfavorable results with external factors. SCM also refers to the desire to make the best presentation of oneself and emotional needs for self-protection.

In the SME context, SME owners tend to attribute their success with their internal characteristics, such as the ability to manage and to blame situational factors, such as bad luck and unconducive economic condition, in the presence of business failure. Thus, SCM is closely related to success recognition and failure rejection.

Experience

Experience is knowledge or the mastery of an event that is acquired through one's involvement with experience individuals to acquire the reputation as an expert. [4] individuals are more willing to take risks in the decision-making process when they are more experienced or familiar with their assignments. In [14] demonstrate that experienced managers observe and evaluate on-going projects periodically and unfavorable project performance cannot be performed until the project completion. In [19] empirically find that generally experienced managers are optimistic about future firm performance and believe in their ability to predict the performance and to achieve positive results.

In relation to SCM, experience likely causes escalation of commitment because experienced individuals will perceive that their ability determines the success of their investments. However, when investments fail, they will attribute the failure to factors beyond their control. In the SME context, experienced SME owners with SCM will fully understand that if they continue potentially unprofitable investments and the investments turn to be profitable, they can attribute the success to their superior ability in managing their firms. However, if the investments turn to be unprofitable, they can blame other factors that are beyond their control.

SMEs' Investment Decisions

Investment decisions are individuals' or firms' actions that involve asset expansion to generate returns for a certain period. Further, [19] suggest that investment decisions as fund commitments that expectedly generate additional inflows, i.e., funds allocated to specific investments to generate returns or value appreciation. Thus, investment decisions are closely related to the allocation of both internal and external resources to various investment opportunities. Meanwhile, investments of new firms largely rely on entrepreneurs' capital.

In the SME context, investment decisions to purchase production equipment due to increased product demands rely on bank-based financing. These investments sometimes do not provide returns as previously expected, thus implying that investments potentially fail. SME owners who invest in risky new businesses with uncertain prospects need continuous persistence and tenacity [7]. Persistence in achieving business goals determines entrepreneurs' way of thinking and mainly affects their business success [3]. The ways entrepreneurs generate and process information lead to persistence in entrepreneurship behavior [9]. Entrepreneurs demonstrate their persistence through their behaviors to continue their investments, although these investments potentially fail due to irrational decision making.

In [11] reveal that irrational investment decision making is a widespread phenomenon and potentially incur great risk. Further, [16] suggest that investment decision-making behavior is affected by the attitude toward investment risk. Next, Park, Ramesh, & Cao (2016) propose that how investment decision makers perceive risks and react to the risks depends on personality traits, beliefs, and expected returns of the risks, and perceive investment risks subjectively because they manage to predict their actions. Thus, it can be argued that entrepreneurs' investment decisions are affected by their behavior and how they perceive risks from their investment decisions.

The Relationship between SCM and Escalation of Commitment

SCM refers to individuals' tendency to relate their success with their efforts and their failure with their bad luck. Attribution leads to escalation of commitment when decision makers associate project losses with failure. The association motivates them to ignore the losses and make self- justification that leads to escalation of commitment. In [4] identify SCM as an observing actor where ones tend to perceive their behavior as the effect of situational factors while others' as the impact of theirs. Meanwhile, [22] mention that self-serving attribution bias is identified with a willingness to take risks to succeed but an unwillingness to be responsible for failures. In [31] define self-serving attribution as a tendency to relate positive outcomes with one's internal characteristics and negative outcomes with external factors. Also, SCM significantly affects escalation as mediated by the desire to improve past outcomes.

In [32] argue that attribution is a basic mistake in assessing others' behaviors. Individuals tend to underestimate the strength of the situation and situational pressure and consider what they see as individual strength or weakness. In [3] explain that individuals tend to blame situational factors when they fail and to distort their positive contribution to the tasks. Similarly, [28] predict that individuals tend to attack innocent third parties, and attribution bias exacerbates the violation of the psychological contract.

SCM is related to SMEs because SME owners tend to acknowledge their success and to deny the failure of their investment decisions. SME owners relate their success with their ability and skills and ignore the potential external reasons such as luck. When SME owners make investment decisions, they can learn their actual ability in making investment decisions.

Based on the above arguments, the first hypothesis is formulated as follows:

H1: SME owners with high SCM exhibit greater escalation of commitment than SME owners with low SCM.

The Interaction of SCM and Experience on Escalation of Commitmen

In [37] establish that individuals who are more experienced or familiar with their assignments are more willing to take risks in making decisions. In [5] suggest that experienced managers have sufficient knowledge to observe on-going projects and to evaluate targeted returns in investment periodically and they understand that they cannot have poor project performance until the project completion. In [22] find that experienced managers are generally optimistic and overconfident on future firm performance and rely largely on their ability to predict performance and to generate positive outcomes.

Meanwhile, SCM is a cognitive phenomenon where individuals tend to associate success with their innate aspects, such as future perspective, and attribute failure to situational factors (Bradley, 1978). Attribution is affected by the needs for self-appreciation, i.e., individuals' tendency to continue failed investments to achieve success and their desire for self-protection that refers to irrational rejection to be responsible to failure. In [26] find that self-attribution of past success motivates individuals to make decisions. Their confidence that develops from past acquisition leads their firms to appreciate unprofitable commitments (. Thus, it can be argued that self-attribution is closely related to experience that leads to escalation of commitment.

SCM that is supported by experience causes escalation of commitment, implying that experienced SME owners with SCM tend to continue their investment decisions because if the investments are profitable, they can attribute the success to their skills and ability. However, if the investments are unprofitable, they attribute the failure to bad luck and external conditions beyond their control. Based on the arguments, the second hypothesis is formulated as follows:

H2: The interaction between SCM and experience causes escalation of commitment.

3. Methodology

Research Design

This study used a laboratory experiment design with a 1x2 factorial. The experiment design used the posttest control group. Subjects were SME owners in Semarang City, Central Java, Indonesia that were classified into two groups that each consisted of 30 SME owners. The independent variables were SCM and experience, while the dependent variable was escalation of commitment. Table 1 below displays the experiment matrix.

Table 1. Matriks SCM terhadap Eskalasi Komitmen

SCM	
Tinggi	Rendah
1	2

A pilot test was performed to analyze whether the experiment design needed improvements so that the real experiment was reliable and free from validity threats. Internal validity measured the validity of the causal relationship between the dependent and independent variables. The study tested the effects of SCM on and the interaction between SCM and experience on escalation of commitment. Consequently, this experiment is possibly subject to internal validity. For example, history threat may emerge because when the experiment was performed subjects were visited by guests that caused the discontinuation of experiment and experimenters need to make new appointments. Further, maturation threats occurred when subjects were tired because they had worked from 05.00 to 13.00. The experiment then had to start between 16.00 to 17.00 to give subjects more time to rest. Next, the testing threat is due to repeated experiments that tested subjects after being given manipulation on investment decision making. Lastly, mortality threat refers to subjects' failure to participate in the experiment completely because of their physical factors. In this case, the experiment had to take a relatively short time (about 30 minutes) to prevent subjects from fatigue and boredom in providing information to the experimenters.

The pilot study was executed to students of a private university in Central Java. The results of the pilot study informed the improvement process of the experiment module. The study used descriptive statistics, one-way ANOVA (to test the effectiveness of the randomization of subjects' demographic characteristics) and independent sample t-test and univariate analysis to test the hypotheses.

The Operational Definition and Measurement of Variables

Escalation of commitment refers to the decision to allocate additional resources to an unprofitable investment with unfavorable future return prospect (Fox et al., 2009). Escalation of commitment is related to investment decisions and the explanations of investment decision makers.

SCM is the attribution of success with one's skills and failure with situational or external. SCM was manipulated with high and low self-attribution.

Experience is one's knowledge or mastery of an event that was acquired through involvement with individuals with sufficient knowledge to acquire a reputation as an expert. The experiment used the length of business operation as the proxy of experience.

Experiment Procedure
The experiment instrument consisted of a case material of investment decision making, a list of questions on subjects' demographic characteristics, and a case for manipulation checks. All instruments, measurements, and questions of this study applied to SME owners. The main laboratory experiment involved of pressure-cooked milkfish SME owners in Semarang, Central Java, Indonesia as the participants

Experiment Setting
The experimenters performed the laboratory experiment by directly visiting SME owners' business location to mitigate demand effect when subjects acted as expected by the experiment because they were aware of the goals of the manipulation. The study then classified subjects into two groups based on the experiment treatments as displayed by Table 1. Experimenters asked subjects to fill in the questionnaire that asked their sex, age, educational level, and length of business operation. Then, subjects received the investment decision-making case that consisted of business challenges, business target, and business opportunities. High SCM was manipulated by informing subjects that they had beliefs and ability to coordinate with their suppliers, and they had put much efforts to develop new products. Meanwhile, low self-attribution was manipulated by informing subjects of the presence of bad luck and market uncertainty. Manipulation check asked 5 (five) questions to subjects related to the case. Subjects passed the manipulation when they answered at least three questions correctly. Next, subjects were instructed to make decisions regarding new product development of milkfish meatball. Specifically, they had to decide whether they launched milkfish meatball as scheduled or delayed the launching for four months ahead to reevaluate the feasibility of the new product development.

4. Results and Discussions

Experiment data was acquired by the experiment by visiting the business locations of pressure-cooked SME owners in Semarang, Central Java, Indonesia. The data collection process took place between January 17 and February 28, 2019. The experiment classified subjects into two groups (high and low SCM). The experimenters explained the investment decision-making simulation based on the guideline in the simulation. The explanation lasted for 15 minutes. The experimenters then asked the manipulation check questions on the simulation scenario, subjects' decision making, and subjects' belief in their decisions and the reasons that underlay their decisions. The process took place for 15 minutes, implying that the experiment for each subject lasted for 30 minutes. The grouping process did not refer to the subjects' demographic characteristics to ensure that the randomization was effective because each subject had the same opportunity in the investment decision case.
There were 12 male subjects and 48 female subjects. Based on the subjects' age, 32 subjects were between 30-50 years old, and 28 subjects were 51-71 years old. Further, 29 subjects graduated from elementary school or junior high school, while 31 subjects graduated from senior high school or university/ college. Subjects' varied demographic characteristics suggested mitigated the likelihood that these characteristics affected escalation of commitment.
ANOV aimed to ensure that escalation of commitment was not affected by subjects' demographic characteristics. Table 2 shows the results of the ANOVA.

Table 2 The Effect of Demographic Characteristics on Escalation of Commitment

Independent Variable	Escalation of Commitment		
	Df	**F-Statistic**	**Sig**
Sex	1	0.058	0.810
Age	1	0.761	0.386
Education	1	0.287	0.594
Length of Business	1	0.295	0.589

Table 2 demonstrates that subjects' demographic characteristics (sex, age, education, and length of business operation) did not affect escalation of commitment as indicated by the significance values of each demographic variable that is above 0.05.
The Results of Manipulation Check of Escalation of Commitment
The manipulation check asked five questions regarding

investment decision making that consisted of business challenges and opportunities with options of “yes” and “no.” Each correct answer was scored 1 (one). Thus, subjects who answered all questions correctly would receive a total score of 5. The results showed that all 60 experiment subjects passed the manipulation check, and consequently, their responses could be processed further for the analysis.

Test of the Effect of SCM on Escalation of Commitment

The first hypothesis predicts that SME owners with high SCM exhibit greater escalation of commitment than SME owners with low self-attribution. Table 3 and Table 4 display the results of the independent t-test to test the hypothesis.

Table 3 Group Statistic

SCM		N	Mean
Escalation	Low	30	12.6667
	High	30	45.3333

The outputs of the group statistic show that the average score of escalation of commitment for subjects with low SCM was 12.6667 while for those with high SCM was 45.3333. The results implied that subjects with low SCM were less certain to commit escalation of commitment while those with high self-attribution were much certain to escalate their commitments.

Table 4 Test of the Effect of SCM on Escalation of Commitment

		Levene test		t-test	
		F	Sig	F	Sig
Escalation	Equal variances assumed Equal variances not assumed	4.631	0.036	-16.689	0.000

Levene test showed an F value of 4.631 and probability of 0.036 < 0.05), suggesting significant results, and the research model had unequal variances. By assuming equal variances, t-test resulted in F value of -16.689 and probability of 0.000 < 0.05. The results indicated that the average score of self-attribution on escalation of commitment was statistically significant. Specifically, subjects with high self-attribution exhibited greater escalation of commitment than subjects with low self-attribution.

Test of the Interaction of SCM and Experience on Escalation of Commitment

The second hypothesis predicts that the interaction between SCM and experience causes escalation of commitment. Table 5 below displays the results of the univariate analysis to test the hypothesis.

Table 5 Test of the Interaction of SCM on Escalation of Commitment

Independent Variable	**Type III Sum of Square**	**Df**	**Mean Square**	**F**	**Sig**
Corrected Model	16547.837[a]	3	5515.946	110.629	0.000
Intercept	43055.295	1	43055.295	863.523	0.000
SCM	13014.811	1	13014.811	261.027	0.000
Experience	231.114	1	231.114	4.635	0.036
SAB*Experience	354.698	1	354.698	7.114	0.010
Error	2792.163	56	49.860		
Total	69800.000	60			
Corrected Total	19340,000	59			

a. R Squared = .856 (Adjusted R Squared = .848)

Table 5 demonstrates that SCM affected escalation of commitment, as indicated by F value of 261.027 and significance value of 0.000 (p< 0.05), implying that the mean scores of SCM of the two groups were statistically different. Meanwhile, experience also affected escalation of commitment, as suggested by an F value of 4.635 and significance level of 0.036 < 0.05.

The results suggested that the mean values of experience of the two groups were statistically different. Lastly, the interaction between SCM and experience also affected escalation of commitment, as shown by F value of 7.114 and significance value 0.010 < 0.05. The adjusted R2 value was 0.848, indicating that the interaction between SCM and experience explained the variability of escalation of commitment by 84,8%.

5. Discussions

The Relationship between SCM and Escalation of Commitment

The first hypothesis predicts that SME owners with high SCM exhibit greater escalation of commitment than SME owners with low SCM. The results show a significant probability value. The findings empirically demonstrate that SME owners are likely to increase their commitments to continue launching the new product as scheduled before when they have high SCM. Meanwhile, SME owners with low SCM tend to delay launching the milkfish meatball new product four months ahead to reevaluate the feasibility of launching the new product.

The investment decision-making case regarding SCM explained that SME owners developed a new product of milkfish meatball and their potential customers support the introduction next week. Subjects with high SCM were informed that they believe in their ability to coordinate with suppliers and to develop the new product. However, a competitor also planned to launch a similar product, and market uncertainty was high. SME owners had two options. First, they could launch milkfish meatball as scheduled previously (indicating escalation of commitment). Secondly, they could delay the introduction of a new product and start the launching four months later to reevaluate the feasibility of launching milkfish meatballs.

The results empirically demonstrate that SME owners with high SCM increased their commitments. Although SME owners faced a competitor that planned to launch a similar product and market uncertainty is high, they still decide to launch the new product as scheduled before. SME owners continue their plans because they had beliefs and ability to coordinate with suppliers and tried sufficiently to launch the new product. The results are in line with Tine (2013) who observes that subjects with internal attribution condition increase their commitments on failed information technology projects. The interviews with the subjects reveal that the following were the reasons to launch milkfish meatballs. First, SME owners were able to coordinate with suppliers, and they had put significant efforts to develop milkfish meatballs so that they were confident that they managed to overcome their competitors and market uncertainty. Second, the milkfish meatball had not been produced by other producers so that they had no competitors. Third, they were optimistic about penetrating the market.

Attribution theory explains whether human behavior is affected by internal factors such as mood, ability, attitude, or efforts or by external factors such as bad luck or other factors beyond human control. These two types lead to very different perceptions of SME owners who make investment decisions. The results empirically show that SME owners believed that they manage to coordinate with suppliers (internal attribution) so that they escalated their commitments. When SME owners were informed that a competitor launched a similar product and market uncertainty was high, they showed internal attribution to continue launching the new product as scheduled before.

The Interaction of SCM and Experience on Escalation of Commitment

The second hypothesis predicts that the interaction between SCM and experience causes escalation of commitment. The results demonstrate that decision makers with SCM as mediated by experience showed escalation of commitment. The findings were because SME owners with internal attribution such as the ability to coordinate with suppliers and significant efforts to develop products, as reinforced by their experiences, continued the new product development as scheduled before despite the presence of competitors and market uncertainty.

Self-justification theory argues that decision makers are motivated to compensate past losses and try to rationalize their efforts or psychologically protect themselves from assessment errors. Their experience facilitates SME owners to justify themselves to continue the new product development. Besides, they also had internal attribution, i.e., they were confident that they managed to coordinate with suppliers and to manage the new product development that leads to escalation of commitment.

6. Conclusion

The main objective of research on supply chain optimization of the production systems using the modelling and simulation method is to examine the possibility of boosting their flexibility during the process of managerial decision-making at the operational level. The results demonstrate that SME owners with high SCM opt for continuing the investment as proposed before. Conversely, subjects with low self-attribution opt for delaying the investment and reevaluating the feasibility of the investment. SCM and experience cause escalation of commitment. It then can be argued that there is a causal relationship between SCM and experience with escalation of commitment. In the SME context, SME owners who have internal attribution, i.e., have the ability to coordinate with suppliers and to manage new product development (SCM), and reinforced by their business experience are more confident to launch new products as scheduled before. In other words, SME owners with high SCM and reinforced with their experience exhibit escalation of commitment.

Study Limitations

The limitations of the study were that some subjects failed to participate in the experiment because of several factors before the experiment and the subjects' physical factors that prevented subjects from participating in the experiment. This research has a threat of demand effect because the experimenter explained the cases of experiment with direct communication to participants. Some of the participants may decide because they try to understand the gesture of the experimenter. This research doesn't test the mitigating strategy to deter the escalation of commitment.

Suggestions for Future Research

Future studies are advised to develop and to apply the recommendations to mitigate the effect of attribution bias on escalation. The process of experimental may use internet tools to decrease potential demand effects.

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