

## **The Effect of Incremental Innovation Towards Product Life Cycle through Customer Relationship Management**

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### **Abstract**

The aim of this study is to analyze the the effect of incremental innovation towards product life cycle through customer relationship management. The population of this study are Madura Batik entrepreneurs in Madura island, Indonesia, with a sampling technique using a proportional random sampling at four regions namely, Bangkalan, Sampang, Pamekasan and Sumenep Regions. The number of respondent are 200 Madura Batik entrepreneurs. This study was carried out by designing questionnaires first and then tested validity and reability of the research instruments. Furthermore, the questionnaire was sent to Madura Batik entrepreneurs who were randomly selected. The primary data was analyzed by structural equation model with the Partial Least Square (PLS) data processing program. The result shows that incremental innovation has effect on customer relationship management, incremental innovation affect product life cycle, customer relationship has effect on product life cycle and incremental innovation affect indirectly towards product life cycle through customer relationship management. It means that both incremental innovation and customer management relationship can extremely extend product life cycle.

**Keywords:** Incremental Innovation, Customer Relationship Management, Product Life Cycle

### **INTRODUCTION**

During this time, product of batik was attached as a cultural part of several regions such as Solo, Yogyakarta, Pekalongan (Vuldy, 1987). In East Java, Madura Island, besides being known as a salt island, turned out to have a wealth of cultural sites in the form of batik. The batik products produced from Madura have specialties ranging from motifs, striking colors and production processes. The variety of motifs owned by Madura batik include spears, rhombus, knits, machetes, and various flora and fauna.

Batik Handicraft Centers - Every Regions in Madura has craftsmen with their own characteristics. But the most are found in Bangkalan and Pamekasan Regeions. Some places include the Tanjung Bumi batik center in Bangkalan, the Banyumas Klampar batik center, Pamekasan, and the Pakandangan Sumenep batik center. The Government of the Pamekasan Regency established the Banyumas Klampar village in the Proppo sub-district as a batik

village. The uniqueness of Madura batik is the manufacturing process. Batik Gentongan is one of the most famous batik traditions in Madura. Batik Gentongan is quite well known for its color strength. The longer process of making batik gentongan becomes more exclusive (Preliminary Survey, 2018).

As a brand that represents Madura, Madura batik can show the great side of the motives, the manufacturing process and the philosophical meaning. This can make batik not only as a cultural product but a heritage that needs to be preserved. Indonesia as part of ASEAN has the potential of heritage tourism with the most market share Hendersen (2009); Hitchcock (2010).

In a marketing perspective, management of this inheritance management in a professional and comprehensive manner can be used to maintain and preserve the authenticity of cultural heritage for future generations while on the other hand it can attract suppliers, distributors, regulators and consumers (Chhabra, 2010). Madura batik brand as one of the cultural attractions plays an important role in the development of creative industries with positive economic and social impacts. The number of Madura batik artisans in Sumenep 200, Pamekasan 592, Sampang 44 and Bangkalan 1503 artisans (Disperindag Jatim, 2017).

Unfortunately, the marketing of Madura batik products is still unstable. In fact, in the past three (3) years, it has stagnated and has dropped. The results of preliminary studies indicate that Bangkalan Regency as the closest area to Suramadu which is a producer of high-quality batik, such as Batik Gentongan continues to decline in sales. Even the existence of Batik Gentongan began to be disrupted by the existence of printing batik that could be produced quickly that are more innovative and varied designs. While more Madurese batik is only relying on striking colors and far from being innovative, which should be explored continuously from the motifs of the heritage of the Madurese people.

The urgency of research on innovation, specifically the incremental innovation and customer relationship management (CRM) synergy in Madura batik, is undeniable, with the hope of finding an adaptive innovation and CRM synergy model, which when applied contributes to the Madura batik product life cycle (PLC). The purpose of this study is to conduct a study of the interrelationship between the principles of innovation, & customer relationship management and product life cycle.

Kotler (2007) states that the product life cycle describes the different stages in product sales. These stages relate to different opportunities and problems regarding marketing strategies and potential profits. By identifying stages that differ from the challenges of the different stages of a product being located, or the stages to be achieved, the company can better

formulate marketing systems. The stages of the product cycle include introduction, growth, establishment, and setback.

According to Chesbrough (2013), incremental innovations include modification, improvement, simplification, consolidation, and improvement of existing products, processes, services, and production and distribution. Meanwhile, Rayna & Striukova (2016) stated that incremental innovation is an improvement and expansion of established designs that result in substantial prices or functional benefits.

Whereas Payne (2015) states, customer relationship management (CRM) is the consolidation of customer management and creating business among companies. CRM is a double-edged sword, presenting opportunities and challenges for companies given their adoption and implementation. CRM is seen as rooted strongly in the concept of relationship marketing, aimed at increasing long-term profitability by switching from transaction-based marketing to customer retention (Christopher et al., 2009).

In recent years, it has been acknowledged that company relationships with customers can be improved by using information technology (Karimi et al., 2010) Ryals and Payne, 2011) that can facilitate and improve customer relations in various ways but primarily enable companies to achieve adjustments, which are the core from a customer-centric organization (Stefanou et al., 2012). In this context CRM has emerged as an ideal vehicle for implementing relationship marketing within the company, with some practitioners suggesting that CRM provides a platform for operational manifestations of relationship marketing (Plakoyiannaki and Tzokas, 2014).

The most appropriate way to implement CRM is through the use of software applications in the form of electronic customer relationship management (CRM) technology. This type of CRM software provides functionality that allows companies to make local customers point of all organizational decisions (Nemati et al., 2015) and such technological and Internet innovations are just a few of the several factors that now make relationships through one-on-one initiatives come true (Chen and Popovich, 2016). The internet has allowed new intermediation patterns to emerge, enabling companies to adopt CRM to focus on effective customer relationship management and utilize the application of on-line technology to facilitate customer supplier relations (Wright et al., 2017).

Kalakota and Robinson (2011) suggest that CRM involves three stages, all of which are designed to manage the customer's life cycle and maximize customer lifetime value: getting new customers; increase the profitability of existing customers and maintain profitable

customers for life. Restuccia, et al. (2015), in the article Product Life-Cycle Management and Distributors Contribution to New Product Development states that innovation is one approach to extend product life cycle. Then, Zou et (2016) in research articles on absorptive capacity, technological innovation, and product life cycles: a system dynamics model revealed that innovation had an effect on product life cycle. Brem, Maier & Wimschneider (2016) in the article “Competitive Advantage Through Innovation: The Case of Nespresso” reveals that innovation can build business continuity. Matsumoto et (2017) in the Sustainability Through Innovation in Product Life Cycle Design article states that innovation incrementally affects the life cycle of a product. Stock et (2017) in article The Model for the Development of Sustainable Innovation for the Early Phase of the Innovation Process reveals that incremental innovation has an impact on the sustainability of the organization. Also, Janka et (2017) on the results of his research on Apple Products: A Discussion of the Product Life Cycle reveals that incremental innovation as a medium extends product life. Similar opinion of Vaz et (2017), in the Sustainability and Innovation in the Automotive Sector: A Structured Content Analysis reveals that the importance of incremental innovation in increasing competitiveness as well as in the product life cycle.

Moreover, Bashir & Khawaja (2013), on the results of his research on The Relationship of CRM, Customer Satisfaction and Customer Loyalty, revealed that CRM has a positive relationship with customer satisfaction and loyalty. The meaning is that electronic-based customer management can indirectly extend the product life cycle. Meanwhile, Dubihlela (2014) in his research article on Impact of CRM Implementation on Customer Loyalty, Customer Retention and Customer Profitability for Hoteliers along the Vaal Meander of South Africa further strengthened previous findings that e-crm can indirectly extend the product life cycle period . Saini, & Kumar (2015), in another research article about The Effect of CRM on Customer Satisfaction: An Empirical Study of Online Shopping, revealed that e-CRM directly affects customer satisfaction. Madson & Madson (2016) in his research article Examining Customer Relationship Management from a Management Fashion Perspective, states that electronic-based customer management has an influence on the realization of customer satisfaction. Bezhovski & Hussain (2016) in his article The Benefits of Electronic Customer Relationship Management to the Banks and their Customers revealed that one of the benefits of electronic banking management is to increase customer satisfaction.

Quresy et (2016), on the results of his research on CRM for Competitive Advantage, found that empirically, the implementation of information technology-based customer

management contributed to the competitive advantage of the product. Janezka et (2016), in his article, the Implementation of CRM in Macedonian Companies obtained in its research activities that the implementation of IT-based customer relationship management contributed to increased sales. Then, Mang'unyi et (2017) in his research The Relationship Between e-CRM and Customer Loyalty: a Kenyan Commercial Bank Case Study found that e-customer management relationships have a significant effect on customer loyalty. Then, Lan (2017) in his research article about Successful Factors of Implementation of Customer Relationship Management (CRM) on E-commerce Company revealed that the implementation of e-CRM has succeeded in increasing customer satisfaction which has an impact on the longer period of product life cycle.

Yahoubi & Yavadi (2017), in the article The Impact of Customer Relationship Management on Organizational Productivity, Customer Trust and Satisfaction with the Structural Equation Model: A Study in the Iranian Hospitals, reveals that there is an interrelation between IT-based customer management and customer trust as well as customer satisfaction. Nunes et (2017), in his research article on Customer Relationship Management in the Agricultural Machinery Market, found that electronic-based customer relationship management was superior to conventional customer management in boosting sales. Furthermore, Wyne et (2017), in the article Customer Relationship Management-Complications and Implementations in Organizations revealed that customer relationship management applications have benefits in increasing product market share.

Based on literatures review and several previous researches, it can be formulated several hypotheses namely (a) incremental innovation significantly effects product life cycle, (b) incremental innovation significantly effects customer relationship management, (c) customer relationship significantly effects product life cycle and (d) incremental innovation indirectly effects toward product life cycle through customer relationship management.

## **METHOD**

This study used a qualitative approach with survey techniques and questionnaires as primary data collection tools. This study consists of three operational variables with definitions (a) incremental innovation is the activity of innovation which includes modification, refinement, simplification, consolidation, and multiplying existing products, processes, services, and production as well as distribution activities, (b) customer relationship management is about identifying the best customer of the company and maximizing the value of the customer by

satisfying and maintaining it by using information technology media, and (c) product life cycle describes the different stages in the history of selling a product. These stages relate to different opportunities and problems regarding marketing strategies and potential profits including introductory, growth, maturity and setback stages.

The research population is batik craftsmen on Madura Island, which includes Bangkalan, Sampang, Pamekasan and Sumenep Regencies. The sampling technique uses proportional random sampling. Primary data collection techniques using questionnaires on a scale of 1-5. The sampling technique uses a proportional random sampling of 200 batik artisans. The primary data was analyzed by structural equation modeling techniques with the Partial Least Square (PLS) data processing program, which began with the parameter test. The validity test and the reliability test. The rule of thumb is shown in the following table.

**Table 2. Parameter of validity test dan reliability measurement**

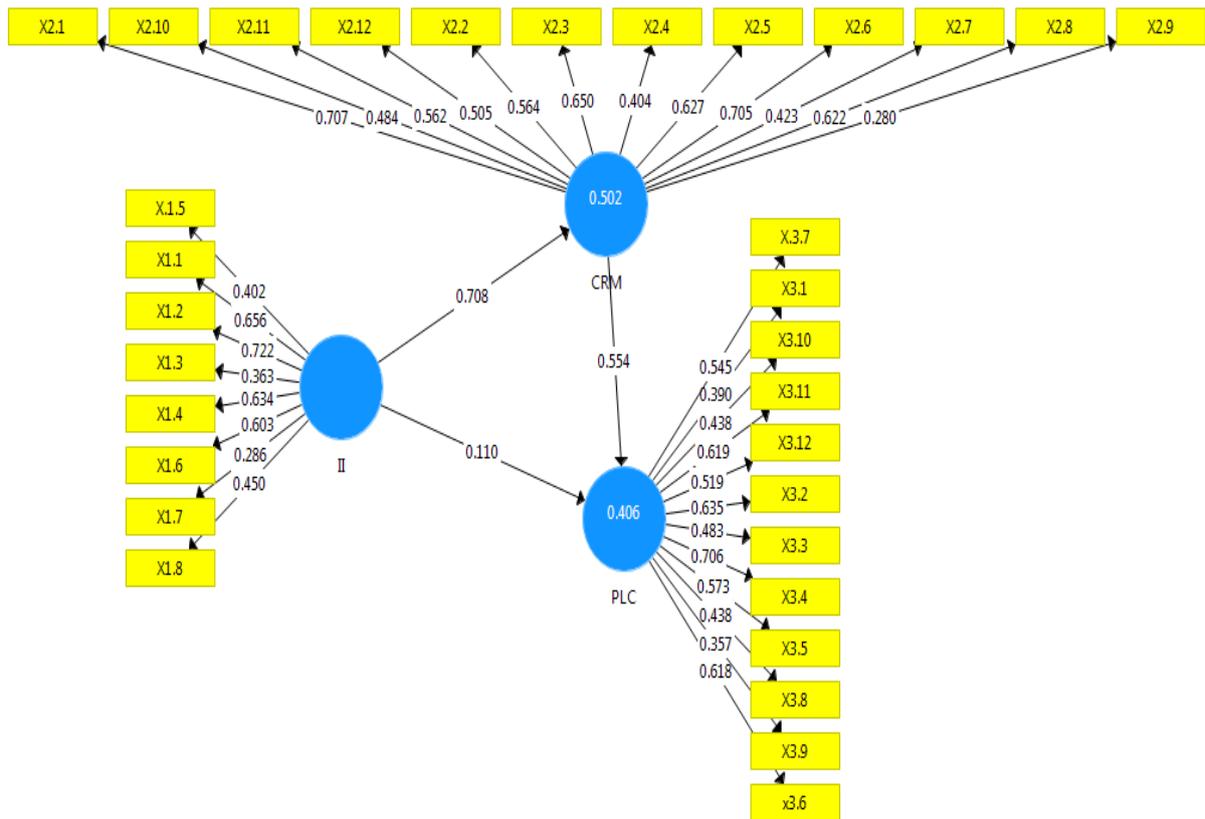
Test	Parameters	Rule of Thums
Convergent Validity	Loading factors	>0.50
	Average Variance Extracted	>0.40
Discriminant Validity	Cross Loading	>0.60
	Communality	>0.50
Reliability	Cronbach Alpha	>0.60
	Composite Realiability	>0.60
GoF: small = 0,1, GoF medium = 0,25 dan GoF besar = 0,38.		

Source: Harkiolakis (2017) & Kock (2013)

Furthermore, after the measurement test is carried out and after all parameters of the measurement model are declared robust, then proceed with testing of good of fit (GoF) index and hypothesis testing. The good of fit index test on PLS-SEM uses the Tenenhau standard (2014), if the value of GoF is small = 0.1, GoF medium = 0.25 and large GoF = 0.38. Then proceed with the hypothesis test. Hypothesis testing using the SmartPLS 3 Professional data processing program, with hypothesis acceptance/rejection criteria using, Probability (P) coefficient is less than 0.05 and t-statistic is greater than 1.96 (Harkiolakis, 2017) & (Kock, 2013).

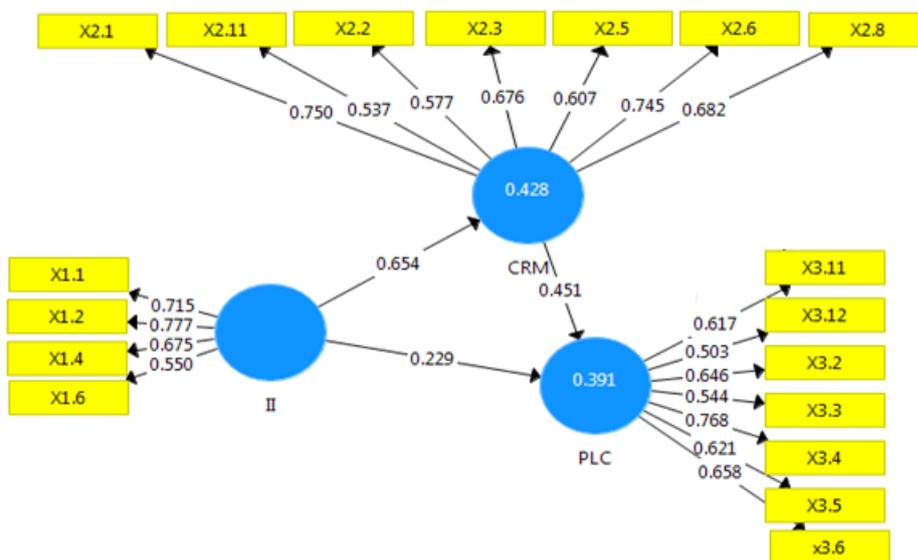
## RESULT AND DISCUSSION

Outer model analysis is carried out to ensure that the research measurement used is valid and reliable. The result of validity and reliability of research instrument test is demonstrated at path diagram below.



**Figure 1. Path Diagram (first calculation)**  
**Source: Processed Primary Data, 2019**

As seen in figure 1, thirteen loading factors of indicators have to be dropped. These are due to those coefficients are less than 0.500. Therefore, the model must be recalculated without those indicators. The result is demonstrated at figure 2 below.



**Figure 2. Path Diagram (second calculation)****Source: Processed Primary Data, 2019**

As shown in figure 2, it is demonstrated that all loading factors have been already higher than 0.500. Therefore, the research instrument has been valid. Other research analysis also show that the research instrument is also reliable. This is due to the coefficients of Cronbach Alpha and Composite Reliability are higher than 0.600. It means, data analysis can be continued to brootstraping analysis. The result is shown at table 2. Based on table 2, all research hypotheses are accepted. This is due to the p-values are less than 0.05. It means, customer relationship management affects significantly on product life cycle, incremental innovation effect customer relationship management and incremental innovation affects significantly product life cycle.

**Tabel 3. Path Coefficient**

	Orginal Sample	Sample Mean	Standar Deviation	T Statistics	P Values
CRM → PLC	0.451	0.459	0.098	4.605	0.000
II → CRM	0.654	0.658	0.054	12.424	0.000
II → PLC	.229	0.234	0.114	2.005	0.045
II→CRM→ PLC	0.295	0.309	0.069	4.268	0.000

Source: Processed Primary Data, 2019

Also, as shown in table 2, it demonstrates that incremental innovation indirectly has effect towards product life cycle through customer relationship management. Based on the table, the p-value is less than 0.05. Therefore empirically, customer relationship management mediates the effect incremental innovation toward product life cycle.

This research findings support several previous researches. Firstly, Bashir & Khawaja (2013), on the results of his research on The Relationship of CRM, Customer Satisfaction and Customer Loyalty, revealed that CRM has a positive relationship with customer satisfaction and loyalty. It means that electronic-based customer management can indirectly extend the product life cycle. Meanwhile, Dubihlela (2014) in his research article on Impact of CRM Implementation on Customer Loyalty, Customer Retention and Customer Profitability for Hoteliers along the Vaal Meander of South Africa further strengthened previous findings that e-crm can indirectly extend the product life cycle period . Saini, & Kumar (2015), in another research article about The Effect of CRM on Customer Satisfaction: An Empirical Study of Online Shopping, revealed that e-CRM directly affects customer satisfaction. Madson & Madson (2016) in his research article Examining Customer Relationship Management from a

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Alaso, Quresy et (2016), on the results of his research on CRM for Competitive Advantage, found that empirically, the implementation of information technology-based customer management contributed to the competitive advantage of the product. Janezka et (2016), in his article, *The Implementation of CRM in Macedonian Companies* obtained in its research activities that the implementation of IT-based customer relationship management contributed to increased sales. Then, Mang'unyi et (2017) in his research *The Relationship Between e-CRM and Customer Loyalty: a Kenyan Commercial Bank Case Study* found that e-customer management relationships have a significant effect on customer loyalty. Then, Lan (2017) in his research article about *Successful Factors of Implementation of Customer Relationship Management (CRM) on E-commerce Company* revealed that the implementation of e-CRM has succeeded in increasing customer satisfaction which has an impact on the longer period of product life cycle.

Besides, supporting the opinion of Yahoubi & Yavadi (2017), in the article *The Impact of Customer Relationship Management on Organizational Productivity, Customer Trust and Satisfaction with the Structural Equation Model: A study in the Iranian Hospitals*, reveals that there is an interrelation between IT-based customer management and customer trust as well as customer satisfaction. Nunes et (2017), in his research article on *Customer Relationship Management in the Agricultural Machinery Market*, found that electronic-based customer relationship management was superior to conventional customer management in boosting sales. Furthermore, Wyne et (2017), in the article *Customer Relationship Management-Complications and Implementations in Organizations* revealed that customer relationship management applications have benefits in increasing product market share.

## **CONCLUSION**

Based on the hypotheses test, it can be concluded that there are linkage among incremental innovation, customer relationship management and product life cycle. It means that in order to extend the product life cycle, we have to do incremental innovation as well as customer relationship management. For that, all Batik handicraft in Madura should apply this

management to maintain as well as increase their market share. Moreover, for further research, it should be carried out another research dealing with factors contributing to the customer relationship management. This is to find the main factors of customer relationship management that really contribute to the extending of product life cycle of Batik handicraft.

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