

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/345990336>

# The interrelation of Customer Relationship Management and Product Life Cycle Through Display Innovation of Batik Madura, Indonesia

Article in *Solid State Technology* · November 2020

CITATIONS

0

READS

590

1 author:



**Pudjo Sugito**

Universitas Merdeka Malang

12 PUBLICATIONS 19 CITATIONS

SEE PROFILE

# The interrelation of Customer Relationship Management and Product Life Cycle Through Display Innovation of Batik Madura, Indonesia

Erna Setijani<sup>1</sup>, Sumartono<sup>1</sup>, Krisnawuri Handayani<sup>1</sup>, Pudjo Sugito<sup>3</sup>, Andini Risfandini<sup>1</sup>  
University of Merdeka Malang, Indonesia

**Abstract-** This study aims to analyze the effect of customer relationship management on the product life cycle, the effect of customer relationship management on the display innovation, the indirect effect of customer relationship management on the product life cycle through display innovation and the effect of display innovation on the product life cycle. The population of this research was batik entrepreneurs on Madura Island, Indonesia. The sampling technique used proportional random sampling. The number of batik entrepreneurs who became respondents was 120. Data collected through distributing online questionnaires. The primary data entered is done editing, tabulating and then processed using Smart Partial Leasquare software. Based on the results of the analysis revealed that customer relationship management effect on the product life cycle, customer relationship management effect on display innovation, customer relationship management indirectly effect on product life cycle through display innovation and display innovation effect on the product life cycle. It means that display innovation and customer relationship management play an important role in enhancing the product life cycle.

**Keywords:** Display Innovation, CRM, Product Life Cycle

## I. Introduction

Indonesia is one of the Asian countries which is rich in various local cultures. Various traditions of the people carried on for generations. In fact, it often colours the shapes and features of many products produced by small and medium businesses. Thus, the uniqueness of Indonesia's local culture makes Indonesian local products also unique, which then becomes its own competitive advantage. Unfortunately, the management of populist-based businesses still not gotten a touch of modern management. So, even though it is unique, it has a relatively short product life cycle (PLC), that is not profitable for small business entities.

Product Life Cycle is the duration of life a product from time of introduction to the saturation period. Every company wants every product that produce have a long PLC. It is because the longer the PLC of a product, the profitability will be higher . Therefore, management often formulates various business strategies to contribute positively to the product life cycle. A research result reveals that incremental innovation has a significant effect on the product life cycle [1]. Incremental innovation is a step by step innovation. First, product display then conformance as a whole.

Probably, the research finding was triggered by an increasingly fierce competition lately. Besides, the dynamics of the market with changing consumer behaviour that makes every business entity must conduct innovation, at least by modify the appearance of the product outside continuously. It was more done, due to some research results stated that the purchase decision also determined by the product appearance, such as packing, product form, etc.

Madura Batik is one of the local cultural heritage. The motifs and colours characterized by the Madura Island people daily traditions. Madura batik made with elementary technology that is carried from generation to generation in Madura society that different from other batik products. Thus, one of the archipelago's cultural heritage products is unique and different from others. Not surprisingly, many tourists who visit Madura Island always bring souvenirs Madura Batik as a souvenirs.

Nevertheless, the Batik Madura quality is outstanding and able to compete with batik products from other regions. Some research has been done on Batik Madura. However, the scope of the research is still narrow and has not been done on the relationship of customer relationship management, display innovation and product life cycle.

Therefore this study was conducted with the aim of (a) analyzing the effect of customer relationship management on the product life cycle, (b) analyzing the effect of customer relationship management on display innovation, (c) analyzing the indirect effect of customer relationship management on product life cycle through display innovation and (d) analyzing the direct effect of display innovation on the products life cycle. Hopefully, these research findings will be beneficial both theoretically and practically in the future.

---

## **II. Literature Review**

The product life cycle is consist of four stages, namely, introduction, growth, maturity, and decline [2]. This concept is used by management and marketing professionals as a factor in determining when it is suitable to improve advertising, reduce prices, expand to new markets, or redesign packaging. Product life cycle has a significant role in order to reach sustainability of a business entity. The longer of product life cycle, could better for the companie's sustainability. Therefore, each businessman have to formulate business strategy continuously to adjust the changing era. The better company adjust to the changing era, it is better companies future. This condition becomes a reasonable hope for all business entities.

Basically, innovation also crucial for determining the product life cycle. It is in view of the ever-changing market desires. If innovation is not carried out, their customers will certainly leave these products. As a result, sales have decrease and product will go a maturation period. Innovation can be in various ways and not necessarily thoroughly. It could be starting from display innovation, incremental innovation to functional innovation. In this way, the products produced will continue to be favoured by market. In other words, the product life cycle will be longer and become a source of cash inflows and increase the company's profitability. Furthermore, when innovation also supported by good customer relationship management, it has more positive implications in extending the product life cycle. Customer relationship management is an information-based customer governance dynamics of customer behaviour. A good customer database is needed when intending to design adaptive customer management. Even customer management now has to adapt to information

technology. This is in view of the increasingly of information technology devices in almost all walks of life. Only by adopting the millennial behaviour society can customer management have a real impact how to extend the product life cycle.

Some research results related to efforts to extend the product life cycle include revealing that the ability to innovate has a close relationship with the product life cycle [3], [4]. The results of this research indicate that the need for innovation is absolute. Meaning, innovation must continue when a business entity want avoid bankruptcy. The research findings reinforce the results of previous studies which stated that innovation would affect the pattern of the product life cycle [5], [6]. Interestingly, innovation can also increase product competitiveness. Certainly, When competitiveness increases, the product life cycle also gets longer [7], [8], [9].

In addition, customer relationship management also very closely related to the product life cycle. It is revealed from several studies that the application of customer relationship management in banking institutions able to build customer loyalty on the realization of a product life cycle that benefits business entities [10], [11]. Furthermore, when innovation is combined with customer relationship management it will increase customer satisfaction leading to the loyalty, which is certainly very closely with product life cycle [12],[13].

Even more interesting, it turns out that product and service innovation also increases competitiveness in the market. Certainly in a market condition that is increasingly leading to hyper-competitiveness lately, it will be an adaptive solution in maintaining the existence and continuity of a business entity [11]. The findings of this research are supported by other research articles which reveal that to build competitiveness or competitive advantage requires management that oriented to the customer behavior [14],[15]. Other researchers also gave the same opinion that a combination of customer management and innovation is needed when a business entity wants to extend its product life cycle [16], [17]. Therefore, management absolutely requires the formulation of customer management policies and innovations that are adaptive to market desires. Therefore, based on several previous studies, the formulation of the research hypothesis are (a) customer relationship management effect on the product life cycle, (b) customer relationship management effect on the display innovation, (c) customer relationship management indirectly effect on the product life cycle through display innovation and (d) display innovation effect on the product life cycle.

### **III. Method**

This research was conducted by using a survey approach and the questionnaire was used as a primary data collector. This research consists of 3 (three) research variables. The research variable operational definition is (a) Product Life Cycle (PLC) describes the different stages in the history of selling a product. These stages related to different opportunities and problems regarding marketing strategies and potential profits including introductory, growth, maturity and setback stages, (b) Customer Relationship Management (CRM) is about identifying the best customer of the company and maximizing the customer value by satisfying and maintaining it using information technology media. (c) Display Innovation (PI) are the activity of innovation which includes modification, refinement, simplification, consolidation, and multiplying existing products, processes, services, and production as well as distribution activities. The research population is all Batik craftsmen, in Madura Island, Indonesia. The sampling technique uses proportional random sampling, with 120

respondents. Data collection uses e-questionnaire that is broadcast directly to selected Batik craftsmen. Furthermore, primary data that has been submitted is done editing, tabulated in the excel program then, conducted an analysis. Smart Partial Leasqre 3.0 used to data analysis techniques with two stages, firstly, evaluation of measurement models with a value of composite reliability criteria  $> 0.700$ , Cronbach's Alpha  $> 0.600$ , Rho\_A  $> 0700$ . Furthermore, secondly, to test the research hypothesis are used T-Statistics criteria  $> 1,960$  & P. Value  $< 0500$ . It means that hypotheses can be supported if the coefficients are higher than those criteria.

#### IV. Result

##### Measurement Model

The model measurement will firstly be analyzed with Partial Leasquare (PLS). Based on primary data analysis, construct reliability, validity and discriminant validity can be seen are as follows.

Table 1. Construct Reliability and Validity

	Cronbach's Alpha	Rho_A	Composite Reliability	Average Variance Extracted
CRM	0.845	0.845	0.883	0.521
PI	0.715	0.747	0.839	0.638
PLC	0.834	0.835	0.889	0.667

Source: Primary Data Source, 2020

As shown at table 1, the values of Cronbach Alpha are higher than 0.700, the values of Rho\_A are higher than 0.700, composite reliability are higher than 0.700, the values of composite reliability are higher 0.700 and the values of Average Variance Extracted (AVE) are higher than 0.500 as well. It means, all values of model indicators meet the criteria of validity and reliability. Meanwhile, the path diagram of the interrelation of customer relationship management and product life cycle through display innovation mediation are as follows.

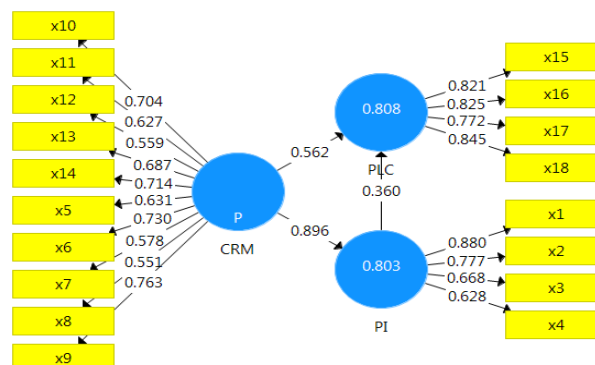


Figure 1. Path Diagram 1

Source: Primary Data Processed, 2020

As demonstrated in figure 1, three loading factors coefficients are lower than 0.600, namely, x7, x8 x12. It should be more than 0.600. These loading factors must be dropped due to invalid. Further, without these loading factors, it should be recalculated and the result can be seen at figure 2 below.

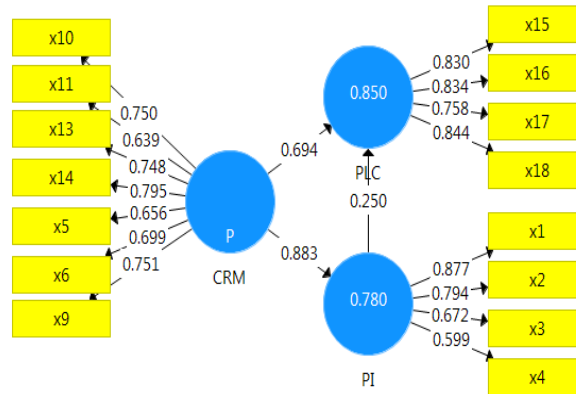


Figure 2. Path Diagram 2  
 Source: Primary Data Processed, 2020

Further, at figure 2, loading factor x4 is 0.5999. It means, this loading factor has been to dropped as well. Then, it required the third calculation without x4. The result can be seen at figure 3 below.

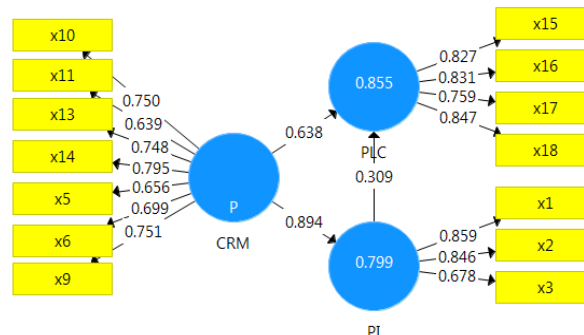


Figure 2. Path Diagram 3  
 Source: Primary Data Processed, 2020

All loading factors in figure 3 have been higher than 0.600. It means that analysis can be continued with bootstrapping analysis to test research hypotheses. The result of path coefficients can be seen at table 3 below.

**Hypotheses Test**

Hypotheses test are conducted to test the research hypotheses. Based on the bootstrapping analysis, the result can be seen at table 3 below.

Table 2. Path Coefficients

	Original Sample	Standard Deviation	T Statistics	P Values
CRM->PLC	0.638	0.098	6.539	0.000
CRM->PI	0.894	0.064	7.605	0.000
PI->PLC	0.309	0.100	3.087	0.002

Source: Primary Data Processed, 2020

Based on table 2. Customer relationship management significantly effect on the product life cycle and display innovation significantly effect on product life cycle as well. That is due to the T Statistics are higher than 1.96 and P values are lower than 0.05 (5%). Further, Customer relationship management indirectly effect on the product life cycle through display innovation. That is due to T Statistics is 3.166 higher than 1.96 and P value is 0.002 lower than 0.05 (5%).

Table 3. Specific Indirect Effects

	Original Sample	Standard Deviation	T Statistics	P Values
CRM->PI->PLC	0.276	0.087	3.166	0.002

Source: Primary Data Processed, 2020

Therefore, it can be stated that three hypotheses at this research can be accepted. It means that both customer relationship management and display innovation play a significant role to enhance product life cycle of Madura Batik in Indonesia.

Tabel 4. R Square

	R Square	R Square Adjusted
PI	0.799	0.797
PLC	0.855	0.852

Source: Primary Data Processed, 2020

Based on table 4, stated the contribution of display innovation to product life cycle is 0.799 or 79.90% and customer relationship management contribute 0.855 or 85.50% to product life cycle is

## V. Result

These research findings support all previous research that stated that to extend the product life cycle include revealing that the ability to innovate has a close relationship with the product life cycle [1],

[3]. The results of this research indicate that the need for innovation is absolute. Meaning, innovation must continue if a business entity wants to avoid bankruptcy. The research findings reinforce the results of previous studies which stated that innovation would affect the pattern of the product life cycle [5], [6]. Interestingly, innovation can also increase product competitiveness when competitiveness increases, the product life cycle also gets longer [7], [8], [9].

Additionally, customer relationship management is also closely related to the product life cycle. This is revealed from several studies that application of customer relationship management in banking institutions able to build customer loyalty towards the realization of a product life cycle that benefits business entities [10]. Furthermore, if innovation combined with customer relationship management, it will increase customer satisfaction leading to loyalty, which is certainly very closely related to the product life cycle [13].

Even more impressive, the product and service innovation also increases competitiveness in the market. Certainly in a market condition that is increasingly leading to hyper-competitiveness lately, it will be an adaptive solution in maintaining the existence and continuity of a business entity [11]. The findings of this research are supported by other research articles which stated that to build competitiveness or competitive advantage requires management that is oriented on the customer behavior [15]. Other researchers also gave the same opinion that a combination of customer management and innovation is needed when a business entity wants to extend its product life cycle [16], [17], [18]. Therefore, management absolutely requires the formulation of customer management policies and innovations that are adaptive to market desires.

## **VI. Conclusion**

Based on the research result and discussion previously, it can be concluded that customer relationship management significantly effect on the product life cycle, customer relationship management indirectly effect on the product life cycle through display innovation and (c) display innovation significantly effect on the product life cycle as well. It means, to enhance the product life cycle of Madura Batik requires both customer relationship management and display innovation. These research findings are very beneficial for further research, particularly to carry out other research related to how to improve the product life cycle for other products.

## **Acknowledgement**

We are the authors wish to thank the Ministry of Research & Technology, Republic of Indonesia. This work was supported in part by a grant of Directorate of Research and Development, Ministry of Research & Technology, Republic of Indonesia 2020.

## **References**

- [1] Setijani, E., Sumartono & Sugito, P., (2019), Mediating Customer Relationship Management On The Effect Of Incremental Innovation On Product Life Cycle, *International Journal of Scientific & Technology Research*, 8(09): 59-64.
- [2] Bright, David S., Cortes, Anastasia H.C., Hartmann, E., Parboteea, K. P., Pierce J.L., (2019), *Principles of Management*, Houston:Rice University.



- [3] Chen, S.T. & Chang, B.G., (2013), The effects of product innovation on product life cycle patterns in Taiwanese motors: views of consumer preferences, *Journal of Business and Retail Management Research (JBRMR)*, 8(1): 53-67.
- [4] Aytun, U. & Kılıçaslan, Y., (2017), Product Life Cycle and Innovativeness: The Case of MENA, *World Journal of Applied Economics*, 3(2): 48-91.
- [5] Sugito, P. & Kamaludin, (2004), Inovasi dan Keunggulan Bersaing: Studi Knowledge Management, Talent Development dan Modal Sosial, *Ekuitas: Jurnal Ekonomi dan Keuangan*, 18(1): 100-117.
- [6] Draskovic, N.; Markovic, M. & Znidar, K., (2018), Product lifecycle strategies in digital world, *International Journal of Management cases*, 3(5): 29-43.
- [7] Nuryakin, (2018), Competitive Advantage and Product Innovation: Key Success of Batik SMEs Marketing Display in Indonesia, *Academy of Strategic Management Journal*, 17(2): 1-17.
- [8] Santouridis, I. & Tsachtani, E., (2015), Investigating the Impact of CRM Resources on CRM Processes: a Customer Life-Cycle Based Approach in the Case of a Greek Bank, *Procedia Economics and Finance*, 19: 304-313.
- [9] Elfarmawi, W., (2019), Correlation Between Customer Relationship Management System Usage, Product Innovation, and Customer Satisfaction, *Foundations of Management*, 11: 23-32.
- [10] Paliouras, K. & Siakas, K.V., (2017), Social Customer Relationship Management: A Case Study, *International Journal of Entrepreneurial Knowledge (IJEK)*, 5(1): 1-18.
- [11] Sofi, M.R. & Hakim, I.A., (2018), Customer Relationship Management as Tool to Enhance Competitive Effectiveness: Model Revisited, *Sage Journal*, 7(3): 201-215.
- [12] Ritter, T. & Geersbro, J., (2015), *Driving Competitiveness Through Customer Relationship Optimization*, Copenhagen: Copenhagen Business School Press.
- [13]. Alawiyah, I. & Humairoh, P.N., (2017), The impact of Customer Relationship Management on Company Display in Three Segments, *Jurnal Ekonomi Bisnis*, 22(2): 132-145.
- [14] Guy, V.C.; Schniederjans, M.J. & Cao, Q., (2015), Diffusion of innovation: customer relationship management adoption in supply chain organizations, *International Journal of Quality Innovation*, 1(6): 10-20.
- [15] Ungerman, O.; Dedkova, J. & Gurinova, K., (2018), The impact of Marketing Innovation on The Competitiveness of Enterprises in The Context of Industry 4.0, *Journal of Competitiveness*, 10(2): 132-148.
- [16] Payne, A. *Handbook of CRM: Achieving Excellence in Customer Management*, New York: Elsevier, 2005.
- [17] Shane, S., *The Handbook of Technology and Innovation Management*, Washington, Wiley-Blackwell, 2009.
- [18] Komninos, I., Milossis, D., & Komninos, N., (2005), *Product Life Cycle Management A Guide to New Product Development*, New York: Oreneo.