

Analysis of Postponement Strategy in Paint Retailing: A Case Study

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ABSTRACT: In today's highly competitive environment, companies have to achieve agility in order to respond effectively to the rapidly changing customer-driven markets. Effective Supply chain management is the key for betterment of companies. Postponement is an organizational concept; it means delaying differentiating activities in the supply chain until customer orders are received. The postponement strategy in supply chain management can enhance a company's flexibility to effectively meet the requirements of the growing varieties of product and quick deliveries. In this paper, an attempt is made to find out the factors that will improve supply chain performance using postponement strategy. Possible difficulties and increased resource consumption in initiating postponement at retailer's level are also included in the study to capture realistic scenario. The objective is to study the postponement concept in paint industries and find out its benefits and limitations. A survey based approach to get responses from retailers of selected paint manufacturing organization is used to collect primary data which is analyzed using statistical tools. It is established that postponement has resulted in better customer satisfaction through higher flexibility, improved service level, improved convenience and reduced inventory management costs.

KEYWORDS: Supply Chain Management, Postponement, Performance Improvement, Inventory Management, Paint Industry.

1. INTRODUCTION

Competition in the market are increasing day by day, it forces the organizations to enhance their productivity and marketing techniques. To improve the value of product more focus is on the improvement of their supply chain structure. Supply chain is the systematic set of management of one or more upstream and downstream flows of products, finances, information, services from a source to their customers. To improve the supply chain of any enterprise the manufacturers need some smart techniques with less efforts and minimum investments. Postponement strategy is one of such types of technique that smartly improve the effectiveness of supply chain.

“Postponement” or “Delayed Differentiation” is a strategy to customize the product in parts. At a point of postponement a standardized module or platform starts to acquire customer or market specific characteristics. A standardized module can be further modified according to the demands of customers. This technique is widely implemented in many organizations and results in decreasing inventory, lesser obsolescence, and

better forecast, improve customer satisfaction, reduce risk of lost sales etc. With the help of postponement strategy the company can develop their product in Japan manufacture in India and sell in Europe.

The postponement concept is also applied to paint industry to maximize profit and service level, to increase its market share and also reduce the stock keeping units, raw material, holding cost, forecast error and uncertainty in demand. XYZ is an Indian paint manufacturing firm that has employed the postponement strategy successfully in its emulsion product category. This has helped it to maintain profitability that is consistently higher than the industry average and has probably contributed to increasing its market share over a period of time.

2. LITERARY BACKGROUND

Postponement was first introduced by Alderson(1950) in marketing literature, he state that postponement strategy could reduce the costs from a marketing point of view by postponing to as late as possible the product differentiation.

Within postponement the product is not finalize until a customer order are received, companies will finalize their output according to the customers choices or preferences and even customize their products. Production in bulk is not a future order safety it will make higher inventory holding cost. Postponement provides a strategic way to make shorter lead time and lesser inventory. In distribution channel the concept of postponement was applied first by Bucklin (1965), according to Bucklin postponement is a means by which risk will shift from a supplier to buyer and he extends it to the postponement-speculation principle. Bowersox (1978), discussed about the reduction of distribution cost by forecasting demands prior to product shipment. There are various successful implementation of postponement discussed in literatures which are also increasing interest in the concept. Postponement can implement at various channels of supply chain there is no fix point of its application it needs a study that helps to understand its implementation. The literatures are available for better understanding the benefits and barriers cone across its application.

The concept of postponement has a wide history in research and development. There are various researchers all over the world, working on postponement. Various successful applications of postponement are also discussed to understand this concept. Table 1 show the continuous research conducted in the domain of postponement.

Table 1- Literature review of Postponement Strategy

| S.No. | Year | Researchers | Description of study |
|-------|-----------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | 1950 | Alderson | The first to create the concept of postponement. He stated that it could reduce costs from a marketing point of view by postponing to as late as possible the product differentiation. |
| 2. | 1965 | Bucklin | Theoretical paper establishing the concept, focused on the role of postponement in positioning inventory in the market channel. |
| 3. | 1984 | Shapiro | Theoretical contribution from a logistics perspective positioning in relation to inventory positioning broad in the supply chain |
| 4. | 1988 | Zinn and bowersox | Modeling study to access the relevance of specific postponement application in the distribution and manufacturing in the context of various operating circumstances |
| 5. | 1988 | Zinn and levy | Theoretical work building on buckling paper on marketing channels, including economic and marketing theory such as transaction costs and the role of power in positioning inventories. |
| 6. | 1990 | Zinn | Modeling study expanding on the Zinn and Bowersox paper |
| 7. | 1992,1998 | Christographer | Specific section within book showing that postponement is a key concept for the confifuration of the supply chain in the future. |

| | | | |
|-----|------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8. | 1992 | Bowersox et al. | Survey study to assess characteristics of organization and management in relation to postponement study |
| 9. | 1993 | Cooper | Theoretical work giving examples of specific postponement application in configuring the supply chain, using operating characteristics in trading off applications |
| 10. | 1993 | Lee et al. | Modeling study with the Hawlett Packard assessing the benefits of one specific postponement application in the manufacturing compared to a situation without postponement |
| 11. | 1995 | Bowersox | Follow up survey of the bowersox et al. study suggesting that postponement has increased in application over the last 5 years |
| 12. | 1997 | Van Hoek | Case study of postponement within a wine company, comparing the application with alternatives with or without postponement |
| 13. | 1997 | Feitzinger and Lee | Case study of Hawlett Packard showing managerial implications of postponement and describing its implementations. |
| 14. | 1998 | Van Hoek et al. | Four case studies on operating circumstances that impact the validity of postponement application and a study of the implementations drivers and processes |
| 15. | 1998 | Pagh and Cooper | Theoretical overview of the postponement concept based mostly on earlier work by Zinn and Bowersox |
| 16. | 1998 | Van Hoek | One case study and a survey covering postponement application throughout the supply chain and drawing conclusions about the impact of operating and market circumstances. |
| 17. | 2001 | Van Hoek | The rediscovery of postponement a literature review and directions of research |
| 18. | 2003 | Patrik Appelqvist | Postponement is known as a way to reduce risk and inventories while still providing high product variety and acceptable response times. The paper is a case study that uses simulation for quantifying these benefits for a consumer electronics company. |
| 19. | 2004 | Biao Yang | covers review of postponement strategy |
| 20. | 2007 | Christopher A. Boone | Postponement as an strategy and its applications evolving supply chain management |
| 21. | 2010 | Alessio Trentin | Design for form postponement: do not overlook organization design |
| 22. | 2016 | Bin Shen | Inventory management research for the fashion industry |
| 23. | 2018 | Shantanu Shankar Bagchi | Optimization of postponement process for a two stage modular manufacturer |
| 24. | 2018 | Kathleen lococca | An empirical study of service postponement: locating the push-pull boundary |

3. METHODOLOGY

A questionnaire based survey is conducted for collecting the information. 39 samples (respondents) were taken from different XYZ paint industry's retailers from Ujjain and Indore cities. A questionnaire consisting of 43 questions was served directly to the retailers for collection of various useful information. The questionnaire comprises of 9 factors: 6 of them are potential benefits after application of postponement and the remaining 3 are the barriers that affect the application of postponement. These factors (Fi) are as follows:

F1: Cost reduction, F2: Flexibility, F3: Customer satisfaction, F4: Inventory control, F5: Information, F6: Service Level, F7: Cost increment, F8: Problem in staff selection, F9: Dependency on machine

A response was collected to each question on a 5-point Likert scale (1= Strongly Disagree, 2= Disagree, 3= Somewhat Agree, 4= Agree and 5= Strongly Agree). Statistical analysis was done using SPSS 16.0 software. A quantitative approach is used to analyze the research problem. Reliability test, multiple regressions and Pearson's correlation coefficient of all the factors are calculated and insights are drawn from the results of these tests.

4. DATA COLLECTION AND ANALYSIS

SPSS 16.0 is used for carrying out the analysis of the collected data. Descriptive statistics were calculated which are presented in Table 2

Table 2- Descriptive statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|-------------------------------|----|---------|---------|--------|----------------|
| 1. Cost reduction | 39 | 3.14 | 4.29 | 3.8608 | 0.3030 |
| 2. Flexibility | 39 | 4.00 | 5.00 | 4.5077 | 0.2332 |
| 3. Customer satisfaction | 39 | 3.80 | 4.80 | 4.2821 | 0.3169 |
| 4. Inventory control | 39 | 3.20 | 4.40 | 3.6308 | 0.2992 |
| 5. Information | 39 | 2.75 | 4.75 | 3.7051 | 0.5189 |
| 6. Service level | 39 | 3.67 | 5.00 | 4.2137 | 0.2808 |
| 7. Cost increment | 39 | 2.75 | 4.50 | 3.8269 | 0.4259 |
| 8. Problem in staff selection | 39 | 2.50 | 4.75 | 3.5321 | 0.5797 |
| 9. Dependency on machine | 39 | 3.50 | 4.50 | 4.0342 | 0.2423 |

The benefits and drawbacks of application of postponement strategy are also discussed on the basis of qualification.

Benefits: It includes cost reduction (CRA), flexibility (FA), customer satisfaction (CSA), and inventory control (ICA), information (IA) and service level (SLA).

Drawbacks: It includes cost increment (CIA), problem in staff selection (PSSA) and dependency on machines (DMA).

Where A=average

a. **Qualification:** The following pie charts show the number of respondents in each section which makes our analysis easier.

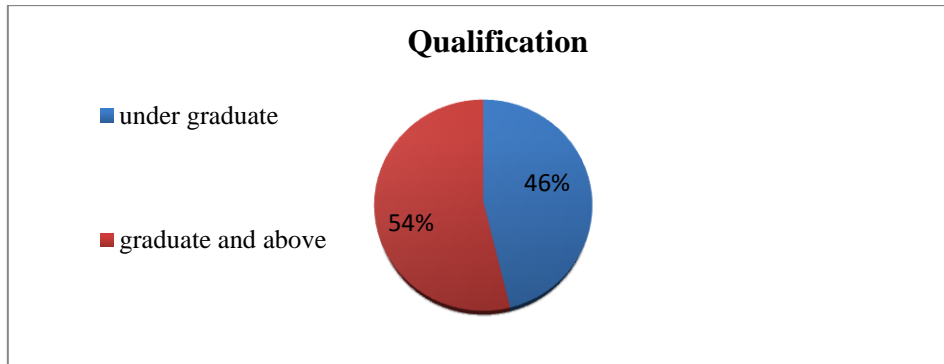


Table 3- Descriptive Statistics Based on Qualification

| Factors | Qualification | | | |
|------------------|--------------------|--------|------------------------|--------|
| | Under Graduate(18) | | Graduate and above(21) | |
| | Mean | Std.D. | Mean | Std.D. |
| Benefits | | | | |
| CRA | 3.8968 | 0.3052 | 3.8299 | 0.3051 |
| FA | 4.5111 | 0.2398 | 4.5048 | 0.2330 |
| CSA | 4.1444 | 0.2894 | 4.4000 | 0.2966 |
| ICA | 3.7333 | 0.3360 | 3.5429 | 0.2375 |
| IA | 3.5972 | 0.5566 | 3.7976 | 0.4784 |
| SLA | 4.2037 | 0.1672 | 4.2222 | 0.3548 |
| Drawbacks | | | | |
| CIA | 3.7778 | 0.4102 | 3.8690 | 0.4445 |
| PSSA | 3.5139 | 0.5970 | 3.5476 | 0.5788 |
| DMA | 4.0833 | 0.2000 | 3.9921 | 0.2711 |

It is evident that there is no significant difference between the values of mean scores of benefits and drawbacks based on qualification of retailers. This means that the technology involved is user friendly and does not require any additional qualification, the technology involves software which decides the quantity of pigment that needs to be added to get desired shade. It seems to be easy to handle and convenient for users.

Pearson's Correlation Coefficient

Table 4 shows the Pearson's correlation coefficients among various factors calculated by SPSS 16.0 software. The value of a correlation coefficient can vary from +1 to -1. A minus one indicates a perfect negative correlation, while a plus one indicates a perfect positive correlation. A correlation of 0 means there is no relationship between two variables

Table 4 shows the correlation between benefits factors.

Table 4- Correlations Between Benefits

| | | CRA | FA | CSA | ICA | IA | SLA |
|-----|---------------------|--------|-------|-------|--------|------|-------|
| CRA | Pearson Correlation | 1 | .154 | -.035 | .488** | .115 | -.127 |
| | Sig. (2-tailed) | | .350 | .835 | .002 | .487 | .440 |
| | N | 39 | 39 | 39 | 39 | 39 | 39 |
| FA | Pearson Correlation | .154 | 1 | .062 | .223 | .095 | .389* |
| | Sig. (2-tailed) | .350 | | .706 | .173 | .564 | .014 |
| | N | 39 | 39 | 39 | 39 | 39 | 39 |
| CSA | Pearson Correlation | -.035 | .062 | 1 | .039 | .047 | .192 |
| | Sig. (2-tailed) | .835 | .706 | | .812 | .776 | .242 |
| | N | 39 | 39 | 39 | 39 | 39 | 39 |
| ICA | Pearson Correlation | .488** | .223 | .039 | 1 | .204 | .108 |
| | Sig. (2-tailed) | .002 | .173 | .812 | | .213 | .514 |
| | N | 39 | 39 | 39 | 39 | 39 | 39 |
| IA | Pearson Correlation | .115 | .095 | .047 | .204 | 1 | .143 |
| | Sig. (2-tailed) | .487 | .564 | .776 | .213 | | .386 |
| | N | 39 | 39 | 39 | 39 | 39 | 39 |
| SLA | Pearson Correlation | -.127 | .389* | .192 | .108 | .143 | 1 |
| | Sig. (2-tailed) | .440 | .014 | .242 | .514 | .386 | |
| | N | 39 | 39 | 39 | 39 | 39 | 39 |

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

* . Correlation is significant at the 0.05 level (2-tailed).

It is seen in table 4 that there is a significant positive correlation between cost reduction and inventory control at 0.01 level it indicates that postponement results in better inventory control, these by reducing the cost of inventory and eventually resulting in overall reduction in operating cost at retailer's level. Similarly there is a significant positive correlation between service level and flexibility at 0.05 level which can be interpreted as when the postponement is used it increases the flexibility and service level because the variety to choose from has increased significantly as customer has spectrum of 3000 shades to choose from and service level is increased because any customer demand of a particular shade quantity and packing is readily met from existing stock.

Multiple Regressions

Multiple regressions is a statistical tool used to derive the value of a criterion from several other independent, or predictor, variables. It is the simultaneous combination of multiple factors to assess how and to what extent they affect a certain outcome. This technique breaks down when the nature of the factors themselves is of an immeasurable or pure-chance nature.

Table 5- Differentiating Variables in Multiple Regressions

| Dependent variables | Independent variables |
|----------------------------|-----------------------|
| CS (Customer Satisfaction) | CR (cost reduction) |
| | F (flexibility) |
| | IC (inventory cost) |
| | I (information) |
| | SL (service level) |

Table 6-Coefficients

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3.422 | 1.317 | | 2.599 | .014 |
| | CRA | -.026 | .212 | -.025 | -.125 | .901 |
| | FA | -.022 | .260 | -.016 | -.084 | .934 |
| | ICA | .033 | .215 | .031 | .154 | .879 |
| | IA | .011 | .107 | .018 | .103 | .919 |
| | SLA | .213 | .217 | .189 | .982 | .333 |

The multiple regression analysis helps us to understand the increase in customer satisfaction as dependent phenomena which depend mostly on better inventory control, better information sharing and increased service level. However the cost reduction and flexibility were not found to be factors directly responsible for increased customer satisfaction.

Reliability analysis

Cronbach's alpha is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examinees. It was first named alpha by Lee Cronbach in 1951. Cronbach's alpha is a reliability model of internal consistency, based on the average inter-item correlation. Alpha varies from 0 to 1, since it is the ratio of two variances. Empirically, however, alpha can take on any value less than or equal to 1, including negative values, although only positive values make sense. Higher values of alpha are more desirable. In table 7 we calculated the Cronbach's alpha if any of the item deleted.

Table 7-Reliability Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|------|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| CRA | 31.7325 | 2.919 | .179 | .685 |
| FA | 31.0856 | 2.898 | .307 | .667 |
| CSA | 31.3112 | 2.960 | .124 | .695 |
| ICA | 31.9625 | 2.677 | .439 | .643 |
| IA | 31.8882 | 2.097 | .552 | .603 |
| SLA | 31.3796 | 2.845 | .288 | .668 |
| CIA | 31.7664 | 2.435 | .436 | .636 |
| PSSA | 32.0612 | 2.017 | .512 | .619 |
| DMA | 31.5591 | 2.787 | .433 | .650 |

All values of Chronbach Alpha are more than 0.6 which shows these are good internal consistency of each factor.

5. RESULTS

From the descriptive statistics it is evident that postponement strategy has resulted in high degree of flexibility (mean more than 4.5 with least standard deviation). This is in tune with the objectives of the delayed differentiation as the very purpose of its implementation is to increase the volume flexibility, variety flexibility and offer more options to customer to choose from. Out of three major varieties of paints for economy class, for normal user and most premium quality for high end customer, each category boosts of 3000 shades to choose from. Similarly each shade is available in packing of 50 ml to 20 liter thee by offering “buy as much you need”, flexibility to customer. Increased service level is another benefit (mean 4.22) which is expected outcome of postponement. Reduced stock out situations and demand fill rate near 100% results in higher service level which is highlighted by this study also. Other significant benefit is increased customer satisfaction (mean 4.28) which is resulted due to better information sharing (color scheme, how to paint yourself guidelines, customized solutions and 7 years warranty etc.). However potential benefits of better inventory control and cost reduction are not fully exploited which needs to be addressed carefully. On the other hand dependency on machine has ranked highest in the list of barriers because of the fact that power cuts, slow response of computer has to wait specially in rush time of Diwali festival. Cost increment and requirement of skilled manpower are also found to be serious barriers to implementation of postponement.

6. CONCLUSIONS

The postponement or delayed differentiation has been used as a strategic weapon to achieve benefits like reduced inventory levels, increased service level, higher degree of customization, better control over customer demand management and reducing the cost of return and obsolescence etc. In paint industry it has completely revolutionized the distribution mechanism and has resulted in greater flexibility in variety and volume to satisfy individual customers need at a significant reduced cost. The XYZ paint company studied under this project work has pioneered the concept in India and has significant achievements. The success of postponement strategy can be emulated in other business sectors like apparel, automobile, electronics goods, customer durables etc. This research will be helpful in finding at which point we can implement postponement strategy to get better results, improve supply chain and way to find how it could be applied in other such type of organizations.

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