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# **SOCIAL AND MANAGEMENT RESEARCH JOURNAL**

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# **A Study on the Perception, Usage Rate and Satisfaction of Herbal Products Among Customers in the Northern Region**

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## **ABSTRACT**

*The use of herbs and herbal products has become widely accepted in most cultures. This trend benefits not only manufacturers and retailers, but the consumers as well in terms of having varied choices. Although herbal product sales have seen strong, growth, the local content for these products is only about ten percent. Herbs such as tongkat ali (*eurycoma longifolia*), kacip fatimah (*labisia pumila*), pegaga (*centella asiatica*), serai wangi (*cymbotogon nardus*), and sena makki (*cassia angustifolia*) are well known and very much required in the production of herbal products. This research attempts to understand herbal utilization trends in Kedah, Penang, and Perlis. The main objectives are (a) to understand customers' perception of herbal products, (b) to determine the consumption rate among herbal users, and (c) to measure the satisfaction level in consuming these products. The focus is on highly demanded categories such as Tongkat Ali (*eurycoma longifolia*) and Kacip Fatimah (*labisia pumila*) capsules, herbal coffee, pellets or "makjun", toiletries, rubbing oils, balms, and slimming products. The research results indicate that variables such as price, packaging, efficacy, safety, natural ingredients, and manufacturer's reputation influence customers' perception of herbal products. In light of these findings, herbal producers are encouraged to consider these factors in developing effective marketing strategies to ensure continued satisfaction in the consumption of herbal products.*

## **Introduction**

This research was initiated in July 2002 in response to a growing trend in herbal usage. The purpose is to understand the herbal market in terms of customers' perceptions, usage rate, and satisfaction levels. The purchase of herbal products is showing an upward trend and has brought a positive impact on the Malaysian market which has recorded sales of RM1.5 billion in 2000 and reached RM2 billion in 2001. Herbal products come in various forms – pharmaceuticals, health, food supplements, cosmetics, toiletries and fragrances. The local content at present is only about ten percent with most being imported from Indonesia, China and India. Our government has envisioned itself to be a global producer of herbal raw materials and products by the year 2010. It is planning for a local content target of forty-eight percent. This explains why the Third National Agricultural Policy included medicinal plants as one of Malaysia's main commodities. It emphasizes on making Malaysia the center for herbal product development and raw materials supply. In order to penetrate and successfully compete in the global market, the herbal products need to comply with quality and World Health Organization (WHO) standards and must fulfill consumer needs. Among thousands of Malaysian producers, only 149 herbal companies were found qualified under the Good Manufacturing Practice (GMP) and is a cause for concern for all parties involved.

## **Research Objectives**

This research focuses on factors that lead to customer satisfaction and loyalty. Specific objectives of this research are (a) to understand customers' perception of herbal products, (b) to find the consumption rate among herbal users, (c) to measure the satisfaction and loyalty level in consuming these products, and (d) to index important factors for benchmarking.

The herbal product consumers in this study were only confined to Kedah, Penang, and Perlis. The main focus is on their consumption of popular herbal products such as Tongkat Ali (*eurycoma longifolia*) and Kacip Fatimah (*labisia pumila*) pills, herbal coffee, pellets or "makjun", toiletries, rubbing oils, balms, slimming products and herbs used for the treatment of sinusitis or "resdung".

## **Research Design**

### **Research Model**

The research model shown in Figure 1 is a cause-and-effect relationship among variables namely, perceived product quality ( $\xi_1$ ), perceived image quality ( $\xi_2$ ),

Direct Effect on Customer Satisfaction =  $Y_{21} + Y_{22}$

Indirect Effect on Customer Satisfaction =  $(Y_{11} \times \beta_{21}) + (Y_{12} \times \beta_{21})$

Total Causal Effect on Customer Satisfaction =  $(Y_{21} + Y_{22}) + ((Y_{11} \times \beta_{21}) + (Y_{12} \times \beta_{21}))$

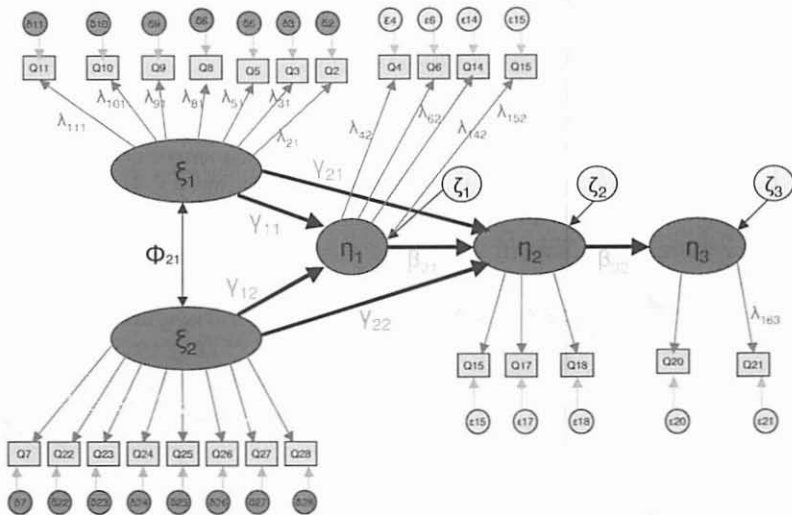


Figure 1: Overall Model: Customer Satisfaction, Antecedent and Consequence

perceived value or worthiness ( $\eta_1$ ), customer satisfaction ( $\eta_2$ ), and customer loyalty ( $\eta_3$ ). These variables are “latent constructs” that could not be measured directly.

The model consists of several latent factors that are operationalized by many observed or measured variables. Latent factors were linked to measured variables that are represented by the small rectangular boxes. These measured variables were “loaded” to latent factors in the pattern shown in Figure 1. The regression weights or ( $\lambda$ ) coefficients represent the magnitude of expected change in observed variables for changes in their respective latent variables. The larger the coefficient; the more it is regarded as the indicator of the latent variable. These “lambda matrices” are included in both the X and Y sides of the model. There are 24 measured variables in the full structural equation modeling while the other 32 variables are unmeasured. The first causal variable is perceived product quality (PPQ). It is basically the evaluation of recent consumption experience of products and is represented by the Greek letter ksi ( $\xi_1$ ). The second causal variable is perceived image (PI). PI is the overall image of the producer from consumers’ perspectives and also represented by the Greek letter ksi ( $\xi_2$ ). PI includes financial strength, trustworthiness, policies towards customers, social contributions, the degree of innovativeness, product competitiveness, and up-to-date manufacturing practices.

The literature on this area has recognized that customer satisfaction is dependent upon value (Howard & Sheth, 1969). Value is the perceived level of product quality relative to the price paid. It is also defined as the ratio of perceived quality relative to price (Anderson et al., 1994). Value is expected to have a direct impact on satisfaction (Anderson & Sullivan, 1993; Fornell, 1992) and to be positively affected by perceived image.

Customer satisfaction can be defined as the overall evaluation of after-purchase utilization of a service. It depends on value (Howard & Sheth, 1969) and is the core of the CSI framework. It mediates the system of cause and effect between antecedents and consequences of satisfaction.

Customer loyalty is the ultimate dependent variable in the model. It is the proxy measure for profitability (Reichheld & Sasser, 1990). Increasing customer loyalty secures future revenues. Satisfied and loyal customers will enhance overall reputation of a company. Loyalty is measured by repurchase intentions, price tolerance, and intention to recommend services to others.

It is theorized that better perceived product quality and image leads to higher perceived value and customer satisfaction. All these will lead to increased customer loyalty.

## **Questionnaire**

The questionnaire used in data collection was designed in accordance to the American Customer Satisfaction Index (ACSI) format and is industry-specific in terms of their variables, outcomes, and measurement questions. It follows a format parallel to the cause-and-effect framework of this research model. Questions number 16, 17, and 18 are identical and are used to measure customer satisfaction index (CSI). These are commonly accepted measures of customer satisfaction among industries.

## **Fieldwork and Interview**

Data collection was conducted in the early of 2003 and continued over a two-month period. Fieldworkers were UiTM students and salespersons working at Malay herbal shops in Butterworth, Sungai Petani, Alor Setar, and Kangar. They were required to fulfill personal interview procedures – unbiased, non-evaluative, no misinterpretations, and strict confidentiality.

## **Respondents and Sampling**

Respondents consist of individuals from three northern states who regularly purchase and consume herbal products. Data collection was carried out using face-to-face interviews by enumerators who were assigned to various herbal shops throughout the three states.



## Sample Size and Distribution

The sample size was calculated based on the number of measured variables (24) multiplied by 15 = 360, and collected from Kedah (120), Penang (120) and Perlis (120).

## Data Analysis

The research model is based on structural equations modeling (SEM) techniques that link customer satisfaction to its causes and consequences (customer loyalty). SEM incorporates the covariance matrix of the independent and dependent variables and uses the maximum likelihood estimation procedure to derive the “most likely” coefficient values. It also calculates the total effect of each exogenous variable on the endogenous variable (s).

The total effect of perceived product quality ( $\xi_1$ ) on customer satisfaction ( $\eta_2$ ) is calculated based on its direct and indirect effects. Thus, the total effect of perceived product quality ( $\xi_1$ ) on customer satisfaction ( $\eta_2$ ) equals  $\gamma_{21} + \gamma_{11} \times \beta_{21}$ . Similarly, the total effect of perceived product quality ( $\xi_1$ ) on customer loyalty ( $\eta_3$ ) will be  $(\gamma_{21} \times \beta_{32}) + (\gamma_{11} \times \beta_{21} \times \beta_{32}) + (\gamma_{22} \times \beta_{32}) + (\gamma_{12} \times \beta_{21} \times \beta_{32})$ .

$$\text{Direct Effect on Customer Satisfaction} = Y_{21} + Y_{22}$$

$$\text{Indirect Effect on Customer Satisfaction} = (Y_{11} \times \beta_{21}) + (Y_{12} \times \beta_{21})$$

$$\text{Total Causal Effect on Customer Satisfaction} = (Y_{21} + Y_{22}) + ((Y_{11} \times \beta_{21}) + (Y_{12} \times \beta_{21}))$$

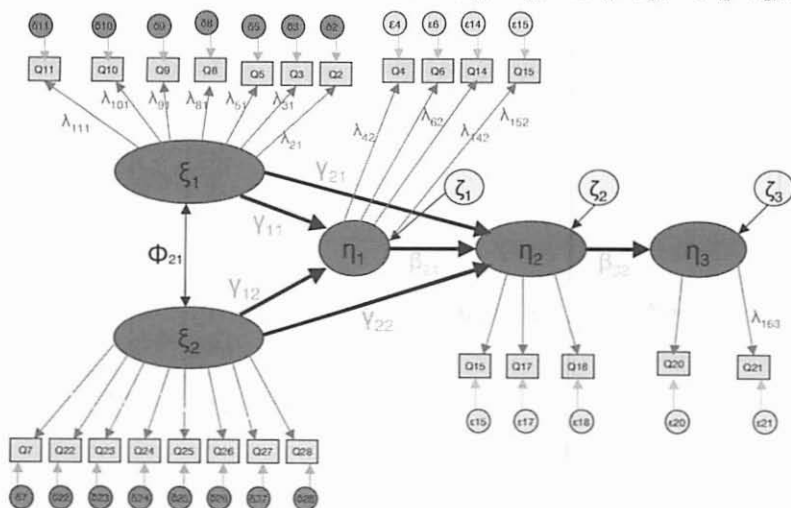


Figure 2: Overall Model: Customer Satisfaction, Antecedent and Consequence

The total effect of perceived image ( $\xi_2$ ) on customer satisfaction ( $\eta_2$ ) and loyalty ( $\eta_3$ ) is also calculated based on their direct and indirect effects of  $\gamma_{22} + [\gamma_{12} * \beta_{21}]$  and  $[\gamma_{21} * \beta_{32}] + [\gamma_{12} * \beta_{21} * \beta_{32}]$  respectively.

Confirmatory factor analysis (CFA) was conducted to assess the impact of the above latent variables, namely, perceived product quality ( $\xi_1$ ) and perceived image ( $\xi_2$ ) on responses in the survey questions. The critical ratio (CR) distribution in AMOS 5.0 printout will determine their influences on survey questions. A CR value of more than 1.96 (at 0.05 level) indicates significant influence on responses. Regression weights ( $\lambda$ ) of lesser than 0.5 will indicate insignificant influence of these latent variables.

## Findings

### Important Indices

The overall indices of relevant variables are as in Table 1. Indices above 70 were considered good. Summarized index scores on variables are as follows:

Table 1: Relevant Indices for Benchmarking

	Product Quality Index	Value Index	CSI Index	Loyalty Index	Image Index
Herbal Balms	72	59	61	62	63
Herbal Health Products	72	70	69	68	70
After Birth Herbs	79	80	80	79	79
Kacip Fatimah Capsules	70	67	68	64	69
Herbal Coffee	67	64	66	64	70
Herbal "Makjun"	72	69	70	68	70
Herbal Toiletries	63	58	58	61	60
Herbal oils	64	61	62	67	60
Sinusitis Products	67	66	68	71	70
Slimming Herbs	70	67	68	69	70
Tongkat Ali Capsules	70	66	68	64	69

### Standardized Regression Weights

The regression weights in Table 2 were extracted from AMOS 5.0 and show the magnitude of latent variables on measured variables. Weights lesser than 0.5 indicate insignificant influence.

Table 2: Standardized Path Coefficient

Measured /Observed Variables	Makjun Products	Herbal Coffee Products	General Health Herbal Products	Slimming Herbs	Kacip Fatimah (Capsules)	Tongkat Ali (Capsules)	Herbal Balms	Herbal Toiletics	Herbal Rubbing Oil	Resdung Capsules
Q2 – Price	0.405	0.393	0.304	0.207	0.469	0.257	0.661	0.057	0.071	0.012
Q3 - Description of Ingredients	0.448	0.545	0.768	0.584	0.677	0.772	0.325	0.593	0.507	0.349
Q5 - Product Packaging	0.607	0.671	0.738	0.396	0.593	0.757	0.931	0.349	0.411	0.796
Q8 - Product Safety	0.7	0.84	0.739	0.793	0.723	0.808	0.531	0.774	0.685	0.755
Q9 - Product Benefits	0.812	0.825	0.759	0.629	0.74	0.705	0.289	0.93	0.65	0.624
Q10 - Compliance to Standards	0.829	0.837	0.679	0.895	0.753	0.86	0.767	0.946	0.991	0.886
Q11 - Natural & Organic	0.705	0.755	0.755	0.687	0.528	0.756	0.763	0.896	0.643	0.842
Q7 - Manufacturer's Reputation	0.61	0.647	0.665	0.65	0.597	0.656	0.275	0.716	0.544	0.664
Q22 - Company's Stability	0.681	0.888	0.816	0.849	0.794	0.663	0.681	0.878	0.575	0.774
Q23 - Trustworthy	0.785	0.891	0.861	0.862	0.831	0.775	0.815	0.957	0.789	0.565
Q24 - Customer oriented	0.774	0.845	0.801	0.823	0.807	0.766	0.713	0.904	0.859	0.625
Q25 - Corporate Citizenship	0.634	0.762	0.632	0.821	0.719	0.691	0.843	0.699	0.641	0.805
Q26 – Innovativeness	0.935	0.879	0.769	0.893	0.843	0.838	0.991	0.561	0.81	0.75
Q27 – Competitiveness	0.913	0.83	0.698	0.855	0.848	0.824	0.972	0.875	0.83	0.514
Q28 - Technology	0.658	0.852	0.659	0.771	0.789	0.661	0.863	0.837	0.499	0.756

< 0.2 Insignificant

0.2 - 0.5 Small

0.5 - 0.8 Moderate

> 0.8 Significant

## **Total Causal Effects**

The total effects of independent (exogenous) variables on the dependent (endogenous) variables are based on the standardized method. The total effect of Perceived Product Quality ( $\xi_1$ ) on customer satisfaction ( $\eta_2$ ) equals  $\gamma_{21} + \gamma_{11} * \beta_{21}$  while its effect on customer loyalty ( $\eta_3$ ) is based on the formula  $(\gamma_{21} \times \beta_{32}) + (\gamma_{11} \times \beta_{21} \times \beta_{32})$ . Similarly, the total effect of perceived image on customer loyalty equals  $(\gamma_{22} \times \beta_{32}) + (\gamma_{12} \times \beta_{21} \times \beta_{32})$ . Details of their effects are summarized in Table 2.

Perceived Product Quality and Image explains 80% of customer satisfaction and 72% of loyalty in “makjun” products. Similarly, both factors explain 98% of customer satisfaction and 84% customer loyalty in herbal coffee products. Total causal effects on customer satisfaction is based on the formula  $(\gamma_{21} + \gamma_{22}) + ((\gamma_{11} \times \beta_{21}) + (\gamma_{12} \times \beta_{21}))$ . Table 4 and 5 show the summary of effects the two variables had on respective herbal products.

## **Conclusion and Recommendation**

This study was undertaken to find out the perception, consumption rate, and satisfaction of customers towards herbal products that they consume and use. It reveals the following conclusions.

### **Effect of Measured Variables on Perceived Product Quality**

The study reveals that price is a strong indicator of perceived product quality except in the case of rubbing oils, toiletries and sinusitis (resdung) products. For these three products, price does not indicate perceived product quality. Generally, herbal users perceive that the higher the price, the higher is the quality of the herbals.

Natural ingredients are also indicators of perceived product quality for almost all products except “resdung”. For this particular herbal category, users are indifferent whether there are description of ingredients or otherwise.

Product packaging is a strong indicator of perceived product quality. It applies to all products except rubbing oil and herbal toiletries. This means that even without good packaging, customers will still purchase these two product categories.

Product safety is another indicator of perceived quality of product. The reason consumers use herbal products is because they feel that these products are safe. This explains why the market for herbals is still growing rapidly despite these products have yet to be approved by the authorities.

Another interesting finding is that, for all herbal product categories tested, product benefits are another indicator of perceived quality. Product perception

**Table 3: Standardized Total Causal Effect of Product Quality & Image on Customer Satisfaction & Loyalty**

Variable/ Effects	Makjun Products	Herbal Coffee Products	General Health Herbal Products	Slimming Herbs	Kacip Fatimah (Capsules)	Tongkat Ali (Capsules)
Q2	0.532	0.475	0.38	0.264	0.564	0.315
Q3	0.529	0.566	0.778	0.617	0.603	0.781
Q5	0.54	0.661	0.68	0.394	0.582	0.722
Q8	0.674	0.833	0.768	0.787	0.753	0.798
Q9	0.851	0.847	0.821	0.656	0.747	0.74
Q10	0.758	0.783	0.632	0.863	0.71	0.845
Q11	0.7	0.768	0.693	0.694	0.519	0.762
Y <sub>21</sub>	0.685	-3.805	1.893	0.011	1.669	-0.886
Y <sub>11</sub>	0.834	1.15	1.16	0.495	1.056	0.835
Q7	0.621	0.645	0.654	0.651	0.601	0.668
Q22	0.687	0.894	0.811	0.852	0.8	0.666
Q23	0.789	0.892	0.861	0.861	0.838	0.77
Q24	0.79	0.842	0.807	0.822	0.808	0.767
Q25	0.666	0.759	0.643	0.832	0.714	0.694
Q26	0.925	0.877	0.764	0.891	0.836	0.833
Q27	0.904	0.823	0.698	0.855	0.847	0.825
Q28	0.641	0.856	0.658	0.757	0.787	0.656
Y <sub>12</sub>	0.232	-0.184	-0.142	0.429	-0.157	0.162
Y <sub>22</sub>	0.292	1.1	-0.216	-0.009	0.087	-0.132
$\beta_{21}$	-0.166	3.811	-0.789	0.964	-0.807	1.936
$\beta_{32}$	0.896	0.856	0.734	0.899	0.704	0.799
Direct Effect of Product Quality & Image on Customer Satisfaction	0.98	-2.71	1.68	0.00	1.76	-1.02
Indirect Effect of Product Quality & Image on Customer Satisfaction	-0.18	3.68	-0.80	0.89	-0.73	1.93
Total Causal Effect of Product Quality & Image on Customer Satisfaction	0.80	0.98	0.87	0.89	1.03	0.91
Total Causal Effect of Product Quality & Image on Customer Loyalty	0.72	0.84	0.64	0.80	0.73	0.73

**Table 4: Total Causal Effect on Customer Satisfaction**

Product	% Effect
Makjun	80%
Herbal Coffee	98%
General health Herbs	87%
Slimming herbs	89%
Kacip Fatimah	103%
Tongkat Ali	91%

**Table 5: Total Causal Effect on Customer Loyalty**

Product	% Effect on Loyalty
Makjun	72%
Herbal Coffee	84%
General health Herbs	64%
Slimming herbs	80%
Kacip Fatimah	73%
Tongkat Ali	73%

is efficacy-based. Customers purchase these products because of the potential benefits these herbs offer.

All measured variables such as manufacturers' reputation, financial stability, trustworthiness, customer-focus, accountability, innovativeness and competitiveness, as well as good manufacturing practices are significant indicators of what the customers feel about herbal products.

**Usage Rate**

The consumption rate of once-a-day for different herbal product categories range from 56% for Tongkat Ali, 49% for Kacip Fatimah, 30% for slimming, and 41% for herbal coffee. Most of the herbal products are consumed once a day. Consumption of twice a day is also high among consumers.

**User Status**

The respondents are mostly steady users for all the products except for balms and rubbing oil. Many respondents reported that they are no more users of herbal toiletries. We might infer that for these categories, consumers' loyalty is not that strong.

## **Complaints to Producers**

The percentage of respondents who do not complain to producers about the products is high. This may either mean that they are satisfied, do not bother to provide feedback to producers, or there are limited avenues for customers to lodge their complaints.

With this initial study about consumer perceptions regarding herbal products and their consumption pattern, it is hoped that the industry will gain some insights on ways to develop effective marketing strategies to ensure continued demand. With the positive trend we are now witnessing, the manufacturers and consumers have much to look forward to in the herbal market.

## **Suggestions for Future Research**

There is a need for future research to focus on the relationship between exogenous variables – perceived product quality and image, and endogenous variables – perceived value, satisfaction, loyalty with revenue earned by the manufacturers and marketers. However, this requires full cooperation from the herbal producers themselves.

## **References**

- Anderson, E. W. (2000). Foundations of the American Customer Satisfaction Index, *Total Quality Management*, 11 (7), 869-882.
- Brecka, J. (1994). The American Customer Satisfaction Index, *Quality Progress*, 27 (10), 41-44.
- Ecsi Technical Committee (1998). *European Customer Satisfaction Index: Foundation and Structure for Harmonized National Pilot Projects*. Reports prepared for the ECSI Steering Committee, October.
- Ellis, L. and Curtis, C. (1995). Measuring Customer Satisfaction, *Research Technology Management*, 38 (5), 45-50.
- Fornell, C. (1992). A National Customer Satisfaction Barometer: The Swedish Experience, *Journal of Marketing*, 56 (1), 6-21.
- Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J. and Bryant, B. E. (1996). The American Customer Satisfaction Index: Nature, Purpose, and Findings, *Journal of Marketing*, 60, October, 7-18.

- G.A.O. (1991). Management Practices: U.S. Companies Improve Performance Through Quality Efforts, Washington, D.C., *General Accounting Office*, GAO/NSIAD-91-190.
- Gadd, K. W. (1995). Business Self-Assessment: A Strategic Tool for Building Process Robustness and Achieving Integrated Management, *Business Process Re-engineering and Management Journal*, 1 (3), 66-85.
- GrandzoL, J. R. and Gershon, M. (1998). A Survey Instrument for Standardizing TQM Modeling Research, *International Journal of Quality Science*, 3 (1), 80-105.
- Kline, R. B. (1998). *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press.
- Madu, C. N. (1998). An Empirical Assessment of Quality: Research Considerations, *International Journal of Quality Science*, 3 (4), 348-355.
- Malcolm Baldrige National Quality Award Guidelines (1993). U.S. Department of Commerce and Technology, NIST, Washington, D.C.
- Sarapath, J., Benson, P. and Schroeder, R. (1989). An Instrument for Measuring the Critical Factors of Quality Management, *Decision Sciences*, 20, 810-829.
- Tamimi, N. (1998). A Second-Order Factor Analysis of Critical TQM Factors, *International Journal of Quality Science*, 3 (1), 71-79.
- Voss, C. A., Chiesa, V. and Coughlan, P. (1994). Developing and Testing Benchmarking and Self-assessment Frameworks in Manufacturing, *International Journal of Operations and Production Management*, 14 (3), 83-100.