

The awareness level of manufacturing complexity management: An initial study on Malaysians industrialist perspective

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ABSTRACT – Manufacturing complexity (MC) has a various definition according to personnel background, experience, demographics, culture and any other related variable. Even though the term MC seems to bring a negative perspective in manufacturing industry, some scholars believed that MC may be beneficial in many other ways. A questionnaire survey has been done in Malaysian industry to assessed Malaysian perception on MC in general as well as the management of MC. Impressively, the result shows that Malaysian has a positive view towards MC where more than half of the respondents agreed that proper MC management is beneficial to the organization.

1. INTRODUCTION

Nowadays, manufacturing industry is expanding rapidly as the technology improving. As this scenario happened, manufacturing industrialist experienced with difficulties on managing their organization especially the operations. This is where the MC took place where it burdens industrialist silently [1]. There are various definitions of MC as defined by previous researchers. Jost [2] divided MC in two path which are predictable and unpredictable where both are related but should be react in different way of managing. When digging into MC content, it consists of a big amount of data and resources which are interrelated with each other [3]. One of the earliest scholar expressed that MC contains seven ingredients which are part, process, market, product, customer, information flows and organizational structure.

There are a lot of perception on MC as stated studies by previous researchers. A research made by Schuh [4] shown 78% manufacturing firm worldwide admitted that they are struggling in dealing with one of MC element which is product and process variety. Isik [5] and Zhu et al. [6] perceived that MC comes with negative impact while Gorze [7] and Blecker et al. [8] insisted that a proper MC management will beneficial towards manufacturing firms. Both perception above are acceptable and this is the reason to study deeply how to reach the proper MC management.

Thus, to analyse the elements that contribute to MC and the management style in Malaysia, it is important to understand the perception of industrialist here towards MC and the readiness to being disturbed by MC management.

2. METHODOLOGY

According to Mohd Rosdi [3], review on previous research articles is essential to ensure optimum input is gathered systematically from previous works. From the literature study, a comprehensive survey was constructed consists of several perception and elements of MC. This method is chosen due to its broad reachability with minimal cost. The survey was sent to the target respondent by e-mail, postage and by hand to 200 representatives of manufacturing firm across Malaysia. 25.5% respondents returned the survey with complete response. SPSS software was used to analyze the response. This article only includes the analysis on one part of the survey which is awareness level on MC.

3. RESULTS AND DISCUSSION

There are five main questions that concentrated on MC perception in various ways. It includes the role of MC, impact of MC management on sustainability and responsiveness, the mains strategy in managing MC and the responsibility of MC management. Table 1 shows the full data on the respondents' feedback.

Table 1: Response data

Characteristics	Frequency	Percentage
MC is beneficial to organization		
Strongly Disagree	4	7.8
Disagree	3	5.9
Neutral	9	17.6
Agree	23	45.1
Strongly Agree	12	23.5
Managing MC is important to sustain in manufacturing industry		
Strongly Disagree	2	3.9
Disagree	3	5.9
Neutral	11	21.6
Agree	19	37.3
Strongly Agree	16	31.4
Managing MC is important to create responsive practices		
Strongly Disagree	1	2.0
Disagree	3	5.9
Neutral	6	11.8
Agree	25	49.0
Strongly Agree	16	31.4

Main strategy to manage MC		
Reduce Complexity	9	17.6
Avoid Complexity	4	7.8
Control Complexity	38	74.5
Encourage Complexity	0	0
Responsibility in managing MC		
Top Management	38	74.5
Production/Engineering	44	86.3
Sales and Marketing	9	17.6
Logistics	6	11.8
R&D	24	47.1
Quality Control	25	49
Maintenance	15	29.4
Finance	7	13.7
Quality Assurance	21	41.2
Human Resources	8	15.7

There are five main questions to assess the awareness of Malaysian industry on MC represented by 51 organizations in manufacturing industry. A total of 68.6% representative found out the MC is beneficial to organization. This data shows contradiction with Isik [10] that believed MC always come with negative impact on organization. As MC cannot be avoided, manufacturing practitioners must cope with this MC matters with a good manageable way of managing. Malaysian industrialists aware that MC is essential to be managed properly thus awarded in a lot of benefits to the organization.

When asked on the manufacturing sustainability and responsiveness perspective, 68.7% and 80.4% agreed that managing MC properly may increase manufacturing sustainability and responsive practices respectively. Sustainable in manufacturing will open the opportunity for future generation to experience the environment as on today. Similarly, responsive practices in manufacturing encourage fast action and fast result in every problem or situation that need a good decision-making being made. Responsiveness in manufacturing is important in manufacturing as a business or money-making organization to avoid every cent being wasted.

There are four main strategy in basic management which are reducing, avoiding, controlling and encouraging. Surprisingly, 74.5% Malaysian industrialists prefer to control MC. The percentage to reduce and avoid complexity is 17.6% and 7.8% while none choose to encourage MC. This clearly concluded that Malaysian industrialist are aware on the existence of MC in manufacturing cannot be eliminated thus the best way to manage it is by controlling it. The data also shows that Malaysians have a good knowledge and awareness programs and exposed to wide experience in manufacturing industry to admit the fact of MC related. None agree with encourage MC even though the respondents choose that MC is beneficial to organization.

Lastly, the responsibility of managing MC. There are various department or personnel that may experience in facing and managing MC, but people will look up on the person that responsible in managing it. From the survey, among the listed ten department or area that should be responsible in MC management, only two shows the big percentage number which are

top management and production/engineering department with 74.5% and 86.3% respectively. The rest are left long way behind with the average percentage of 28.19%. the result shows that: top management should do their best in managing the MC in and out from the organization; and production and engineering department should manage MC properly because these departments have the highest probability to face MC in routine practice.

4. CONCLUSION

As conclusion, Malaysian industrialists are aware of MC existence and ready to face them by managing them in the right way. MC also is believed to be beneficial to industrialists if managed in the right way.

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