

Resource Based View Perspective of the on Time Delivery in Aerospace Composites Manufacturing Company in Malaysia

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Abstract: Aerospace industry is a high cost and high technology base operations. Every minute and seconds count as cost is getting higher with longer time taken to complete the product and deliver to customer. On time delivery is the key performance in the aerospace industry be it service or manufacturing. An aerospace organization (service or manufacturing) must manage its resources and capabilities to achieve and sustain the on time delivery. This article is to provide a literature reviews of the on time delivery processes in an aerospace manufacturing company in Malaysia from a Resource Based View perspective. This review will be an input to the aerospace manufacturing company and aerospace industry in Malaysia as an optional strategy in managing resources and capabilities in order to meet and sustain the on time delivery.

Keywords: On Time Delivery, Resource Based View Theory, Resource, Capability

I. INTRODUCTION

Aerospace industry is a high cost and high technology base operations. Every minute and second is a cost which is getting higher and higher if longer time taken to complete the product and deliver to customer. Eventhough on time delivery is critically important, there are still challenges that the manufacturing organization have to face and manage diligently. This paper is intended to provide a literature reviews of the aerospace manufacturing industry in Malaysia and the importance of the on time delivery in the industry from the perspective of the Resource Based View Theory.

II. BACKGROUND

The history of the aerospace industry in Malaysia begin originally with the set up of military depot in year 1970 followed by AIROD in 1985, which is focusing on the maintenance, repair and overhaul (MRO). In year of 1995, National Aerospace Blueprint was developed to provide a framework for the development of Malaysia's aerospace industry towards achieving world class by year 2015. It is also an objective to make Malaysia as an aerospace industry hub for ASEAN region by year 2015, thus an aerospace composites manufacturing industry in Malaysia has gradually becoming an important industry on line with the Malaysian government goal (MIDA, 2013). SME was established in 1995 specializing in aerospace metal manufacturing. To embark on a different type of aerospace manufacturing activities, CTRM was set up as a composite manufacturing which involve more on research and development activities. In 1998, Asian Composites Manufacturing Sdn. Bhd. (now known as Aerospace Composites Malaysia Sdn. Bhd.) has been established as a composite manufacturing organization supplying parts for Boeing and Hexcel as prime customer. It was officially open in year of 2000 by Tun Dr. Mahathir Mohamad and has becoming one of the major players in the aerospace industry in Malaysia focusing on composites manufacturing. ANGKASA which is the National Space Center was developed in 2002 followed by Malaysian International Aerospace Center (MIAC) in year of 2005, Spirit Aero in 2008 and Honeywell in 2009 (MIDA,2013).

To stay competitive as an aerospace manufacturing nation globally, Malaysia must move into value-added industries, high knowledge to maintain its competitiveness and economic prosperity. The Malaysian government is constantly promoting the initiative to developed economy by 2020. Malaysian firms are utilized, the challenges of change and the use of technology, as the state has endured decades of economic transformation brought about by trade, global competition and rapid growth (Le &Koh, 2002).

On Time Delivery

Delivery is a very important performance metrics. Literatures on delivery metric proven that delivery is a significance indicator for organization's performance. On time delivery, delivery reliability, faster delivery

times, delivery service, delivery frequency, delivery synchronization, delivery speed, order fulfillment lead time are all the metrics used to measure delivery (Rao, Rao, & Muniswamy, 2011).

To achieve and sustain the 100% on-time delivery, Gunasekaran et al. (2004) emphasized the importance of supply chain partners working together to eliminate the gap between interdepartmental and cross functional to create a smooth flow of resources in the process of attaining the on-time delivery. The study was looking into customer and supplier relationship in achieving the on-time delivery. Increase in customer service level, reduction in total supply chain cost, reduction in order cycle time and inventory cost are among the factors to look into. In this particular study, researcher pointed strongly that the relationship between supplier and customer is crucial in order to achieve on-time delivery.

In a study between seven Swedish manufacturing companies, there are four major metrics to focus on in achieving the on-time delivery. In a research among the seven Swedish manufacturing companies involving at least five study cases found out that differences in performance metrics handling caused a gap in understanding of the situation and requirement necessary to generate on-time delivery. This gap existed due to a different in perception and understanding of the performance metrics implication to the organization and individual department. Even though the study is among the seven Swedish manufacturing companies, the same concept is critically applicable to internal organization between processes and departments. Thus, a smooth continuation and synchronization of resources in the organization will eventually exist (Hofmann, 2008).

In an aerospace manufacturing company under study in Malaysia, the “delivery” means that the company is committed to “On-time delivery of reliable product to meet customer expectation”. On time delivery is one of the five (5) major key performance indicators in the company. It is a systemic metric as it requires an integrated and synchronized effort as an organization’s commonly shared strategy in order to meet the committed delivery. The achievement of the 100% on time delivery is one of the company’s objectives. The negative or positive result of this metric will impact the organization as a whole. Thomas Jacob in his article “Root Cause Analysis of Low On-Time Delivery” mentioned the author Giorgio Merli of Total Quality Management describing the importance of the on-time delivery as

“the ability to deliver products promptly contributes indisputably to sales increase and therefore to sales volume because firms that have that capability will be preferred over their competitors. Furthermore, when ability to serve the market is equal, the firm with lower throughput time will require less wip and less storage space. Thus, its costs will be lower and its operating margin higher” (Jacob, 1997).

Robert Handfield, in the same article, described delivery performance in two different views. The first view looked delivery in term of speed to measure the rate (how fast) a customer order is turn into final delivery and the second view is look at delivery in terms of reliability to measure the percentage of orders delivered by the promised date. The second view is the selected definition applied by the company under study to measure the delivery (Jacob, 1997). JH Berk has done a research on manufacturing performance improvement and identified “6P”’s reasons for failure in meeting delivery which can be grouped into (1) production capacity (2) production control (3) productivity (4) procurement (5) process robustness and (6) product delivery responsibility (J.H. Berk and Associates, n.d.).

Even though the literatures are dated back years ago, the significance of the on time delivery is still a significance indicator in an organization particularly in the aerospace manufacturing industry. On time delivery failures has caused billion dollar lost to aerospace industry. Boeing had learnt a very expensive lesson with the 787 Dreamliner project (Leach, 2009). How does it relate to the RBV approach? Boeing failed to addressed key capabilities and resources in implementing this 787 Dreamliner (Tang & Zimmerman, 2009). Aside from Boeing, Airbus also faced some bad experience as a result of delay in delivery (B. Jorg, K. Andreas, 2008).

III. RESOURCE BASED VIEW PERSPECTIVE

The fact that aerospace is a very expensive and complex manufacturing process, has put the integrated system of resources into a very significance position to bind and link the processes together to get the right, good quality part produced and delivered on time to the customer. It is very critical to have a close linkage not only between customer and supplier but even more critical is the internal strategies that bind and deployed the resources within the organization. The resource based view (RBV) theory provides a strategic way of resource deployment which will results in value generated capabilities towards sustainable competitive advantage. It is also an option for management expert explaining organization’s difference in performance and deploying core competencies to stay competence in business.

Resource based theory is a strategic management approach which originated in 1950’s from Penrose’s idea (1959) of the firm as a coordinated “bundle” of resources which is characterized as valuable, rare, inimitable and non-substitutable that are deployed as an organization capability in value creation to achieve sustainable competitive advantage for the organization. Richard D. Irwin (1971) pointed out that strategy

development is believed to have been shaped by Kenneth R. Andrews who developed the framework in his classic book *The Concept of Corporate Strategy* (David J.C. & Cynthia, A.M., 1995) where he defined strategy as “the match between what a company can do (organizational strengths and weaknesses) within which the universe of what it might do (environmental opportunities and threats)”. The following breakthrough in assessing strengths and weaknesses, and opportunities and threats was being developed by Michael E. Porter in his book *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. Mr. Porter proposed a structure-conduct-performance paradigm of industrial-organization economics which focused on the five structural forces in determining the average profitability of the industry and indirectly impacting the profitability of the individual corporate strategies (Free Press, 1981). However, the focus of the external environment has put the organization into a rigid kind of strategy formulation. Since then, the trend has moved from external to internal strategic formulation. The emergence of the Resource Based View theory has said to fulfill the proposal made by Andrews in his definition which stressed the focusing on what the company can do considering outside opportunities and threats. Barney defined resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness” (Barney, 2001). Another definition of RBV is “a determined collection of assets or resources that are tied “semi-permanently” to the firm (Francisco, 2015).

IV. RESOURCE BASED VIEW FROM OTHER PERSPECTIVE

RBV from marketing, manufacturing and finance point of view (Kamboj, Goyal, & Rahman, 2015) provide a different angle to see the RBV. From an economist point of view, Joseph Schumpeter suggested that private organizations and industries that possessed an abundance of resources are much better able to survive environmental turbulence or what he called as “creative destruction”. Comparatively, a sociologist, Philip Selznick identified distinctive competencies as the valuable capacity and resources for organizations which are supposedly to be identified, invested in and protected. On the other hand, both H. Igor Ansoff and Kenneth Andrews, the private sector-oriented theorists, pointed out the significance of focusing on the resources differences in promoting the strength, weakness, opportunity and threat (SWOT) analysis in handling organizational capacities study. Barney, Peteraf and Wernerfelt described the importance of resources and competencies impacting the organizational survival, growth and effectiveness. RBV also has been used to explain Human Capital deployment. Focusing on the internal resources bundling and deployment, RBV literatures has brought forward the significance role of labor or workers in organization performance (Dunford, Snell, & Wright, 2001). Irrespective of differences point of views, resources management and exploitation of capabilities plays a crucial role in determining the success and sustainability of performance in an organization (Bryson & Ackermann, 2007).

V. RESOURCE BASED VIEW ASSUMPTIONS

Despite the RBV theory introduced by Penrose in 1950s, the significance contribution of this theory was really recognized in the 1980s due to three main reasons. Firstly, the growth of unstable environment requires a more secure strategy formulation. Secondly, competitive advantage is more important than industry attractiveness in making profit. Thirdly, customer preferences and technology changes happen more often and volatile (Francisco, 2015).

In early 2000’s resource based view theory emphasize on resource deployment as a strategy for running a business, contrary to the era of 1980’s, where business focused on the strategy and external environment. As operations grew to become more and more complicated, management of internal environment becomes as critical as external, thus, the need for good internal strategy arose. With this awareness, this research will focus on firm level dependent variables which focus on the competitive advantage and resource deployment at a firm level instead of industry level (Barney, 2001).

Resource based view theory depicted that resource and capabilities produce competitive advantage (Ismail, Rose, & Uli, 2012); (Robinson, 2008). This theory suggested four types of characteristic to describe a strategic resources, which are valuable, rare, inimitable and non substitutable. Valuable resource means the resource contributes to the improved effectiveness and efficiency of the organization, it is rarely can be found in other similar industry or organization, very difficult to imitate and no other resource can be used as the substitute for the same resource that the organization possessed.

For example, in an aerospace manufacturing situation where the research took place, the expertise that the organization possess through its employees training and development programs resulted in a group of experts or subject matter experts that are very rare and very hard to imitate by other competitors. Every single employee at the shop floor and support team are unique in their own way contributing to the production of consistent good quality and on time completion product even though product is fabricated manually. Furthermore, all the product and manufacturing process that takes place will need an approval from the prime customer, Boeing before it can be considered as valid and good to proceed. This makes the process and

technical know-how a very rare resource to the organization as not anyone can just learn and produce similar product without attaining approval from Boeing. Finally, there is no immediate substitute for the product produced by the organization. The brand name that it carries – Boeing – literally means that it is Boeing product. The product produced is meant for Boeing airplane and there is no other substitute produced by other suppliers. Comparing Boeing product to other similar type of product, Boeing is well known for its excellent quality product and there is no substitute for Boeing product.

VI. RESOURCE VERSUS CAPABILITY

The resource based view theory depicts the relationship between internal resources and capabilities to create a competitive advantage in an organization. Resources are those assets (tangible or intangible) the organization own whereas capabilities are the organization's strategic practices that put together all those valuable, rare, inimitable and non substitutable resources to generate a competitive advantage to the organization. Capabilities relate most directly to human capital, thus, the term "natural resource based view theory" was defined where the labor portion is incorporated into the resource based view theory (Robert, 2001).

7.1 Resource

RBV is the strategy that focused on activities to optimize resources and capabilities as the bases for achieving sustain competitive advantage (Francisco, 2015). Resources are tangible and intangible. Skills, human assets, information and organizational assets and relational and reputational assets are among the intangible assets that the firm has. Human capital as intangible resource (skill, experience and knowledge) that is deployed to gain optimum result (A.Hitt, 2006). Actual practice in an aerospace manufacturing company in Malaysia showed the skill set is crucial as applied to the aerospace manufacturing industry. Skill metric is defined for each manufacturing technician and a minimum of 50 percent skill is considered "acceptable" before the newly hired manufacturing technician is release to the shop floor by the training department (Aerospace Composites Malaysia, Training, 2014). Tangible assets are assets that physically owned by the organization and it is creating value to the whole operations. In the research location, a Non-Destructive Testing (NDT) machine is resource to ACM which rarely found elsewhere in Malaysia, it is not easy to copy and no substitute for a usage of similar specification.

7.2 Capability

Another group of intangible assets are capabilities or competence which represents what the firms does (Hill et. al, 2007). Competence was defined by Prahalad and Hamel (1990) as the "collective learning that gives firm the ability to deploy their resources productively". Competence is usually differs from one organization to another and it emerge as the organization grows (Diereckx and Coal, 1989; Ahuja and Katila, 2004) which is said to be hard to apply in a competitive context (Brumagim, 1994). In this research, the collective knowledge and expertise learnt and developed as the employees grow with the organization become the intangible competencies owned by the organization and very rare in the industry. The closest example is the NDT Level three expert in Aerospace Composites Malaysia (ACM) is one of the very rare numbers of competent experts in the world.

Dynamic capabilities concept recently evolved to add more dynamic version of RBV to handle rapidly evolving environment. Dynamic capability was define by Teece et.all (1997), as a "firm's ability to integrate, build and reconfigure competence", similar to what Barney (1991) defined resources to include the "ability to conceive of and choose as well as implement strategies". This dynamic capability possessed by the organization makes the organization operated competitively and ready to take new challenges and new business opportunity when it comes knocking on the door. Aerospace Composites Malaysia (ACM) is a living example of this dynamic capabilities practitioner. From a small aerospace manufacturing operations with 100 employees producing 100s of flat wing panels now operating with 1,000 plus employees producing 10,000s flat and contoured wing panels monthly is a living proof that the organization is capable to integrate, build and reconfigure the employees (human capital) and process (capabilities) to continuously grow and sustain the fierce competition in the aerospace manufacturing industry locally in Malaysia and internationally. Hexcel and Boeing as shareholders are strongly confident of ACM's capability and competence to move with additional works with the approval of an expansion of the current building to a bigger and additional building (Hexcel, 2013).

VII. RESOURCE BASED VIEW - LIMITATION

In many literatures, it has been pointed out that there are two reasons that still implicated this resource based view theory. First, it lacks a single integrating framework and the second is there is limited effort to develop the practical application of the resource based view theory (Robert, 2001). This is supported by Williams, T. et al (2002), who commented that the major problem with the resource based view in strategic

formulation is the limitation on mechanism to translate its resources and capabilities deployment concept into a practical meaningful diagnostic and prognostic managerial capabilities (Hax and Mjluf, 1996). Thus, the RBV practicality is still called for some basic grounded concepts within the practical framework. Its application has been tested relatively in the area of key activities in the industry inclusive of entrepreneurship, innovation, manufacturing competition and performance, market driven manufacturing, demand chain management and industry catch-up strategy for latecomer firms.

The application of the Resource Based View theory of the firm has been made difficult due to the complexity of the process. An example shared by David N. Ford is in the telecommunication network operator in managing the national market liberalization. An organization should develop a strategy as guideline to move forward in manipulating the resources to gain and sustain its advantageous position (Ford, 1998). To get the theory in place, first and foremost, the definition of the word “operationalization” and the reason for the operationalization need to be clearly understood. “Operationalization” is defined as “a formalization of the theory’s ideas and concepts into applicable models which facilitate all stages of strategy formulation and decision making”.

VIII. RESOURCE BASED VIEW THEORY – APPLICATION

To make the RBV operational effectively, an organization’s resource based model need to observe 4 basic characteristics. First is to provide guideline to identify and select a valuable resource. Second is to act as the resources’ intrinsic endowment dynamics. Third is to clearly show how managerial policies affect resource management. Fourth is to possess the ability to trace consequences of potential strategic over time. This is to ensure the ability to measure the resource and capability utilization against the expected result.

IX. CONCLUSION

On time delivery is recognized as critically important company performance measurement. To achieve and sustain the on time delivery, resource and capability has to be managed and deployed wisely. This review provided a basis for further research in the aerospace manufacturing industry in Malaysia. Resource and capabilities are internal strategies that need to be managed and channel through the right process to create added value to have the right product or service manufactured, completed and delivered on the right time.

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