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## Current and Future Trends in the Automotive Industry

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**ABSTRACT:** This paper aims to provide an evaluation of chapter “Project Management in the automotive industry” by Christophe Midler and Christian Navarre. It aims to provide analysis of all the four phases described by the authors on the genesis and evolution of Project Management over past six decades. Along with the overview of the chapter this writing also cites data from various research papers and journals which affirms or contradicts the statements put forward by Midler and Navarre. In the latter half of the paper current and new methods of project management have been suggested which are or can be implemented to enhance the efficiency of an organization.

**KEYWORDS:** Efficiency; Automotive industry trends; Project management methods.

### INTRODUCTION

Project and Development are an integral part of human society. As said in *The Origins of Modern Project Management* by Patrick Weaver projects have been in one form or another for millennia, be it in the form of construction of pyramids or strategic planning of War. Although the term project management came up in the mid-20<sup>th</sup> century at the time of World War II when military organizations functioned in a defined system to work on the Manhattan project.

Project management according to Y.C Chiu in the book *An Introduction to the History of Project Management* is ‘the application of knowledge, skills, tools and techniques to project activities in order to meet project requirements.’ It has been common to all the organization across the globe. In 1940s automotive industry ventured into this field and as the sector grew exponentially over the years more new and complex project management tools were implemented. This paper will discuss the conceiving of the idea of project management and its maturing over the past half century.

### CRITICAL REVIEW

Midler and Navarre in their paper summarize the history of the project management in automotive industry. Midler and Navarre state that the introduction of automotive product management took place post World War II. Patrick Weaver in his report of Mosaic Project “*The Origins of Modern project Management*” dates back the implementation of tools like Line of Balance (LOB) by Goodyear company to early 1940’s, this further strengthens the point put forward by Midler and Navarra. Although during that era, major implementation of these tools occurred in the field of defense and construction. Flow-Line scheduling was first implemented during construction of empire state building. Midler and Navarre chronologically segregated project management in four different phases and then explained its development through these phases.

**Phase 1-The Post war period to 1960:** This phase showed a growth in the car making business. There was little product diversification and were suited for mass production. Standardization and long life cycles for models. The company was divided into individual departments and due to lack of conveyance there was a delay in final release of the product. There was just one point of contact between different teams, the CEO or the senior manager of the company (Midler and Navarre 1368-1388).

**Phase 2-From 1970-1985:** According to Midler and Navarre, The American automotive industry saw a professional approach towards project management with tools like project functions, guidance and review systems. The Auto Industry saw the emergence of “Lightweight project managers”. This led to development of project function although they had no overruling power over the logic of technical department. There was centralization but no proper correspondence between various individual departments. The American auto market was flooded by a torrent of new products especially Japanese, who were providing range of vehicles. This is supported by an article published by Michael A. Cusumano in *Manufacturing Innovation* where he states that Toyota adopted innovation in production management as a part of its competitive strategy and then spent years to make it work. By early 1970s Toyota and Nissan, top producers of Japanese Auto Industry, have matched or surpassed the US counterparts productivity levels though the annual production levels were below. Cusumano also states that other Japanese automakers like Hino,

Daihatsu and Mazda instead of copying the older US or European model they copied production techniques introduced by Toyota. Tools like “just in time” for inventory control and “group integration” for cost reduction were introduced by Toyota.

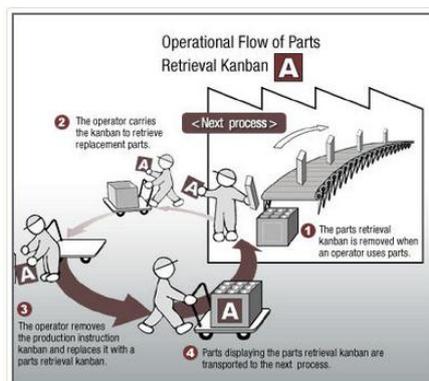


Figure 1. Just in Time model (Toyota).

**Phase 3- From 1985 to 1995:** Midler and Navarre point out the growth in project function during this phase. This resulted in the emergence of new role which was of heavyweight project manager and a new type of engineering called the concurrent engineering. It took the existing label of ‘Shusha’ from Toyota. A ‘Shusha’ had wide range of power and responsibility. Though as stated by writers that increase in project function led to concurrent engineering but we cannot say it was the only cause for it. Landon C.G Miller states in his book ‘Concurrent Engineering Design: integrating the best practices for process improvement’ that in 1990s to achieve quality organization and its mode of operation needs to be modified. Hence these business infrastructure evolution and technology push also stemmed the growth of Concurrent Engineering. Chrysler which was close to bankruptcy implemented new project management tools and divided its department based on vehicle sub-assemblies and functional platform together with allotting specific workforce. Chrysler was followed by Renault in this process. The result was developing of vehicles in comparatively lesser time.

Another change that came about in this field was involvement of the supplier and building of new relationship with the organization. “Compared with the conventional template for competition between suppliers based around detailed project specifications, this new template for the relationship involves, for those taking part in it, the need to modify their organizational and contractual frameworks”, (Midler and Navarre 1368-1388).

Midler and Navarre mention that in the late 1990s as the competition went up Chrysler and Nissan went into deep crisis resulting in them being overtaken by Diemer-Benz and Renault respectively. Nicolas Martelin supports this in the research paper Diemer-Chrysler Merger case states that Chrysler in 1990s had one fourth of the total market share but the CEO of Chrysler Bob Eaton was apprehensive as environmental concerns was threatening the existence of vehicles. Hence to increase its international reach and competition it joined with Diemer-Benz which was then the world’s most profitable carmaker.

**Phase 4- From 1995 to 2003:** According to Midler and Navarre, this phase was an improvement of innovation based competition in automotive industry. Pioneers were searching for better tools to attain leverage over their competitors. The previous ‘Shusha’ model was also facing difficulty as the volume of projects increased. The heavyweight project managers were inadequate to deal with international trends, they were stressed and constrained.

One of the trend was of enlargement of supplier-manufacturer co-operation fields. In the paper Managing Product Development the author Toshihiro Nishiguchi mentions that Japanese

Automakers made much greater use of external suppliers thus reducing the work to be done by the manufacturers themselves. This gave them significant lead over U.S. and European counterparts.

Midler and Navarre emphasize on the leverage which automaker have while forming alliance. The advantage of this approach as mentioned is sharing of risk and cost as well as gaining access to new market.

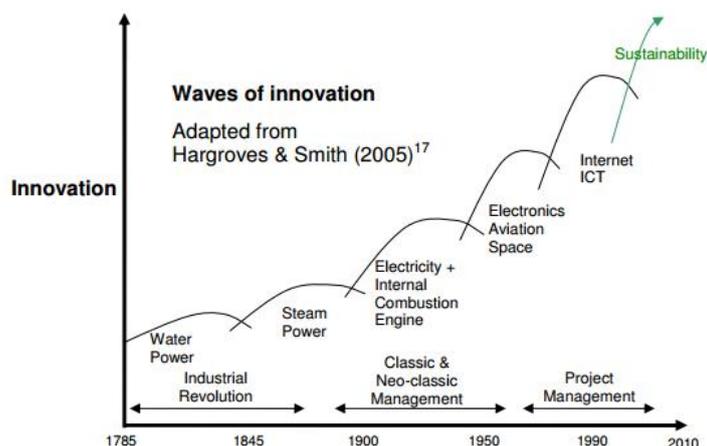


Figure 2. Evolution of management theory – raymond e miles.

### FUTURE OF AUTOMOTIVE INDUSTRY

Automotive Industry has always been exposed to numerous changes. These changes were sometime driven by technology, by needs and lately by environmental regulations. To cater to these alterations the management also needs to be flexible. Since the introduction in 1940s we have constantly seen the system evolve and still at present new tools and approach are being implemented to improve on every front possible. The advancement in the field of information technology has further provided leverage by providing software which could focus on every minute potential of an organization. Product Lifecycle Management is one such tool which is currently used in most of the Industries. It aims to manage a company’s product from the conceptualizing phase to retirement phase. As mentioned in Advanced engineering Informatics by Dimitris Kiritsis we can use embedded system to implement “Adaptive production management for beginning of life (BOL), statistical methods for predictive maintenance for middle of life (MOL) and planning and management of product end of life (EOL).” This would assist in closing of product lifecycle information loop and do e-transformation of product lifecycle information to knowledge. A synergy should be formed amongst the various OEM and knowledge sharing should be motivated. Since the Corporate Average Fuel Economy targets are getting steeper a sturdy collaboration in automotive industry will burgeon fresh ideas to meet these challenges.

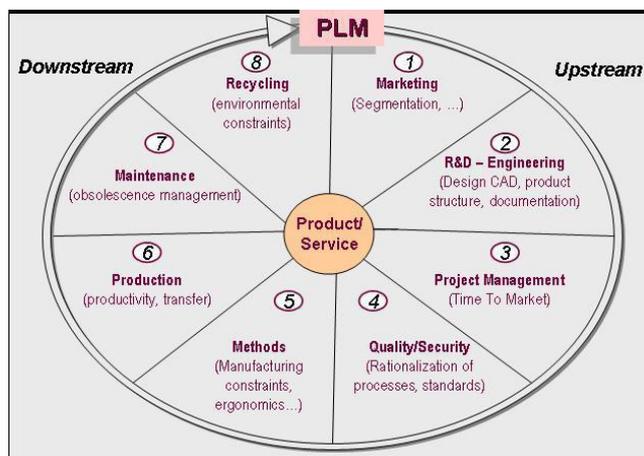
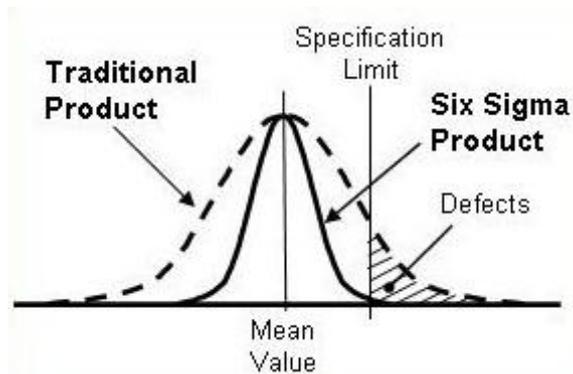


Figure 3. Product lifecycle management loop.

Quality and inventory control has always been a key issue for concern for the management. To address this 6 sigma (a tool of Total Quality Management) was first used by Motorola in 1986. Its motive is to improve the quality of process output by eliminating causes of defects. This aims to achieve a process defect free by 99.999966%. Many companies like Ford, Honeywell, and General Electronics have adopted this tool. Software like ARIS, Actuate provide IT assistance in implementing this methodology.



**Figure 4.** A sigma curve when compared to a product curve without six sigma implemented.

6 sigma is a tool which has been implemented for years. Nishesh Patel and Naveen Vedula in their research paper Dabawallas of Mumbai mention how a small organizations like the Dabbawallas in Mumbai were able to use it by 2006. Hence it can be implemented with much vigor and efficiency in automaker companies which have much better resources at their disposal to achieve higher values of sigma achieve minimum defect and better quality.

A marriage between technology and tradition is required. All the experience and knowledge can be amalgamated with the tools like Liquidplanner, AtTask, Wrike and Gantter to deliver exceptional results.

#### CONCLUSION

Based on the research outlined in this paper it is clear that the evolution in project management in the automotive industry was a direct follow-up of the increasing organizational and competitive demands in the automotive industry. The need was to optimize and implement the best practices to achieve project goals on time. Driven by these needs and requirement early associations were formed which led to today's project management associations. The emphasis have been shifted during the times from scientific approach to 'soft skills' where stakeholders, communication and customers pay a vital role in defining the approach towards a project.

Hence, change is inevitable and will be always be a driving force for development. Merging technology with experience to fulfill present needs will always yield a favorable output and is need of the hour.

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