



COMPARATIVE RESEARCH ON JAPANESE, EUROPEAN AND AMERICAN AUTOMOBILE INDUSTRIES IN PRODUCT DESIGN DEVELOPMENT

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ABSTRACT:

In recent years, there has been a high competition among automotive manufacturers and also there has been a boom of brand using image including design and advertising. However most of board members of companies do not know how to use designs and how to make appropriate decisions on designs. This report is to suggest some clues to find solutions for design management.

1. BACKGROUND AND METHOD OF THIS RESEARCH

Since 2002, though there are firm-to-firm and category-to-category variations, Japan's

manufacturing industry as a whole has been showing signs of solid recovery. Aside from noteworthy briskness in material manufacturing, such as steel, the year-end book closing of fiscal 2006 revealed remarkable growth in the manufacturing sector, including automotive and electronics sectors, as well as of IT and financial sectors. In the automotive and electronics industries, a number of elements, such as performance, user-friendliness, price, servicing, brand, and design, are intricately intertwined with what is called "Product Strength." Especially in terms of brand and design, although it is a qualitative and obscure area, it is believed to have a great impact on product strength.

This manuscript is a report on a part of the results of research conducted jointly with partners in Japanese Europe and US markets since 2005. Focused on automotive design, the research compares how design decision making is involved in the product development process in different regions, and considers what type of decision must be made and with what timing.

The reason why we researched about this subject is that there are high competitions of automotive sale in world wide, competing in technology, prices, brand images, design services, fuel consumption, ecological solution and so on. Considering the situation, how should we develop the automobile suitable for its market? Technology, designs and management are the main factors, and they are the most important issues for automotive development. And behind it, many management and technology books are sold well and people have been engaged in how to operate them well. However, most of businessmen and academic people did not know the efficient decision-making of their product designs, that is to say, how to decide, which way, to which direction, using what kinds of material, when, how many times we should have meetings and examinations in the market to develop their designs. Major companies need to improve the way of development, especially design process. All the matters here are about whether it is possible to make it improve or not.

In the first stage, to make a compilation of the present situation, as well as a study of relevant literature, hearings with the firms were conducted. So, this research work has studied 19 automotive manufacturers in world wide, including 5 Japanese manufacturers, 11 European manufacturers and 3 US manufacturers.

1. BACKGROUND AND METHOD OF THIS RESEARCH

The first focus of this research is on the fundamentals of design process (Figure 1) shows an example of design process in one company and design decision-making in automotive development.

Car Development Procedure

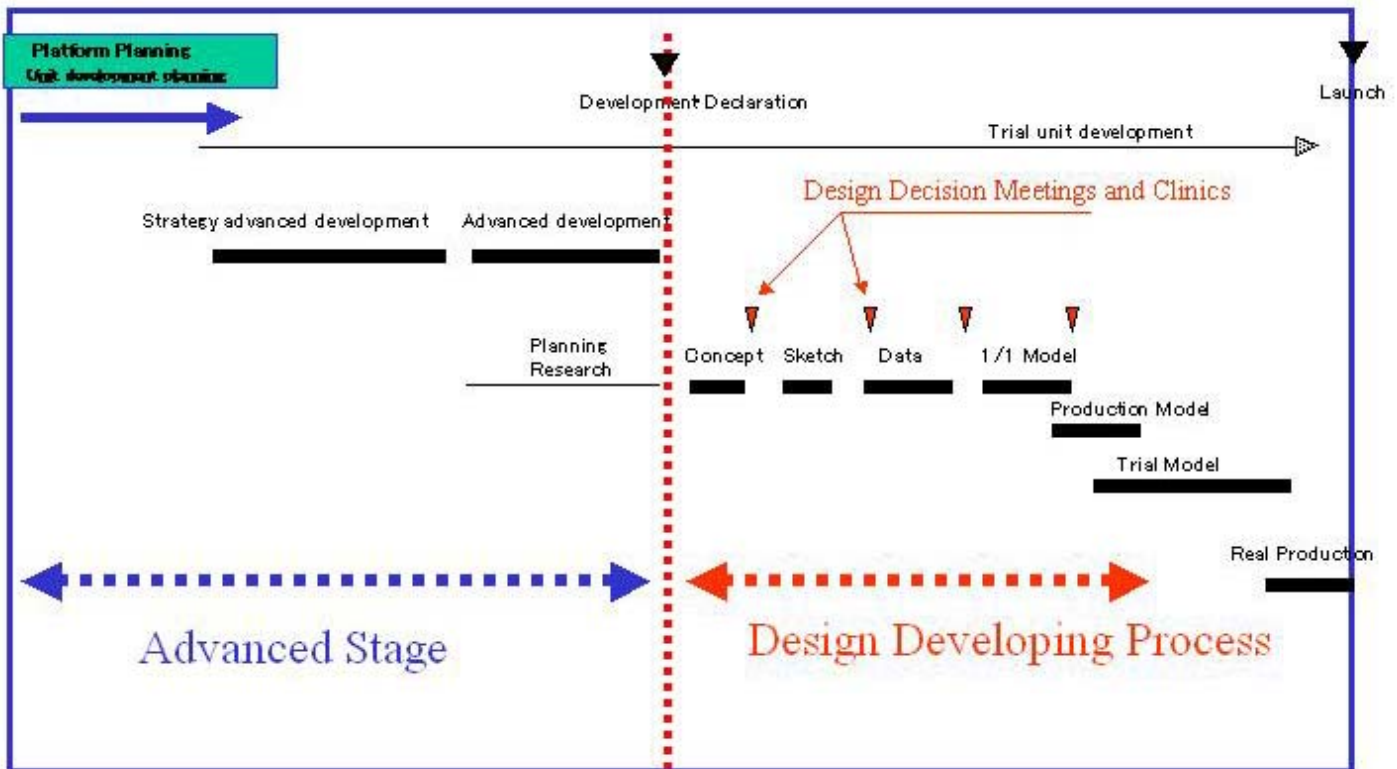


Figure1: Car Development Producer

Design decision making involves a number of steps, including the meetings to decide design direction, the interim points used to narrow down design proposals, the timing to finalize design, the phase of repeating proto-type making, and the final product design check prior to distribution (man-power, development period and investment). Of these development lead-time and frequency of design decision-making meetings (including clinics), identified as the fundamental items, were compared among leading firms in Japan, Europe and USA. The degree to which these factors are linked to corporate performance (volume of sales and measurement of customer

satisfaction) was examined. That is, basic differences and effects in product design development by Japanese and Western manufacturers, and their relatedness to basic performance indicators of corporate management were studied.

How differences in the length of development time and the frequency of design decision-making meetings are interlocked with corporate performance (number of vehicles sold and customer satisfaction measurement) was revealed by using the 2005 data including consumer satisfaction measurement in Japanese, European and US markets (research numbers –500 people).

1. METHOD OF RESEARCH ON DIFFERENCES IN DECISION MAKING BY AUTOMOTIVE MANUFACTURERS IN JAPAN, AMERICA AND EUROPE

Japanese firms have a history of absorbing a lot of know-how in technology, design and business management from America and Europe. Today, however, when the Japanese firms have established their own management philosophy and systems, from the viewpoint of decision-making and development lead-time in the area of product development and design, it is evident that higher efficiency is achieved by the Japanese firms than their Western counterparts. (Fig.2)

First of all, it reports the result of differences in research of the relation between Consumer Satisfaction and Developing Term (Figure 2, Figure 6).

The reputations of Japanese firms are ranked in the middle class, but development periods are so short, compared to western firms. Japanese consumer satisfaction to Japanese companies is rising every year, keeping the developing period; rather, can be said that it is getting shorter and shorter.

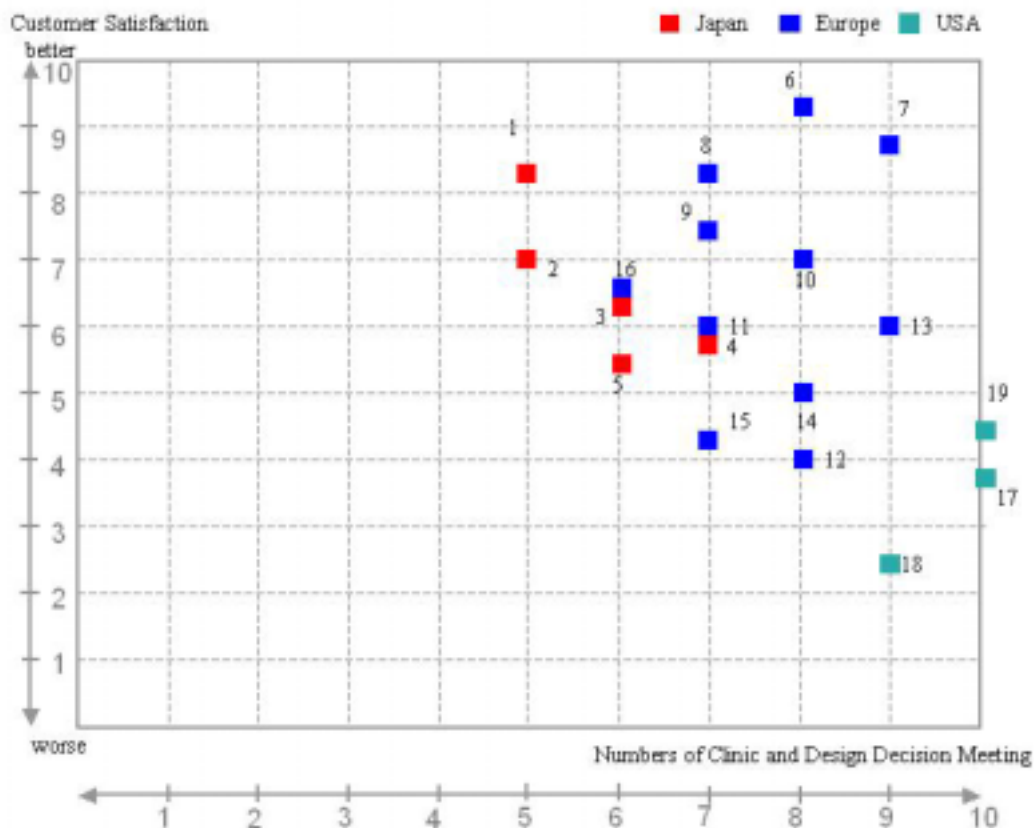


Figure 2: The relation between Consumer Satisfaction and Developing Term

And secondly, seeing the relation between consumer satisfaction and numbers of times of clinics and design decision meeting, it can be said that consumer satisfaction is not closely related to number of times of clinics (test in market) and design decision-meetings. They may be in inverse proportion. In addition, European firms are good balanced and ranked in the middle class in the relationship between consumer satisfaction and number of times of clinics and design decision meetings. On the other hand, US firms don't have efficient ways, seeing this result, which shows they need long development period and a lot of clinics and design decision meetings (Figure 3, Figure 6).

And again, in verse proportion to the development period of US firms, their reputations are slowly getting down (Figure 5). In that sense, there is one issue occurred to me that neither the development period nor the numbers of clinics and design decision meetings are related to the consumer satisfaction.

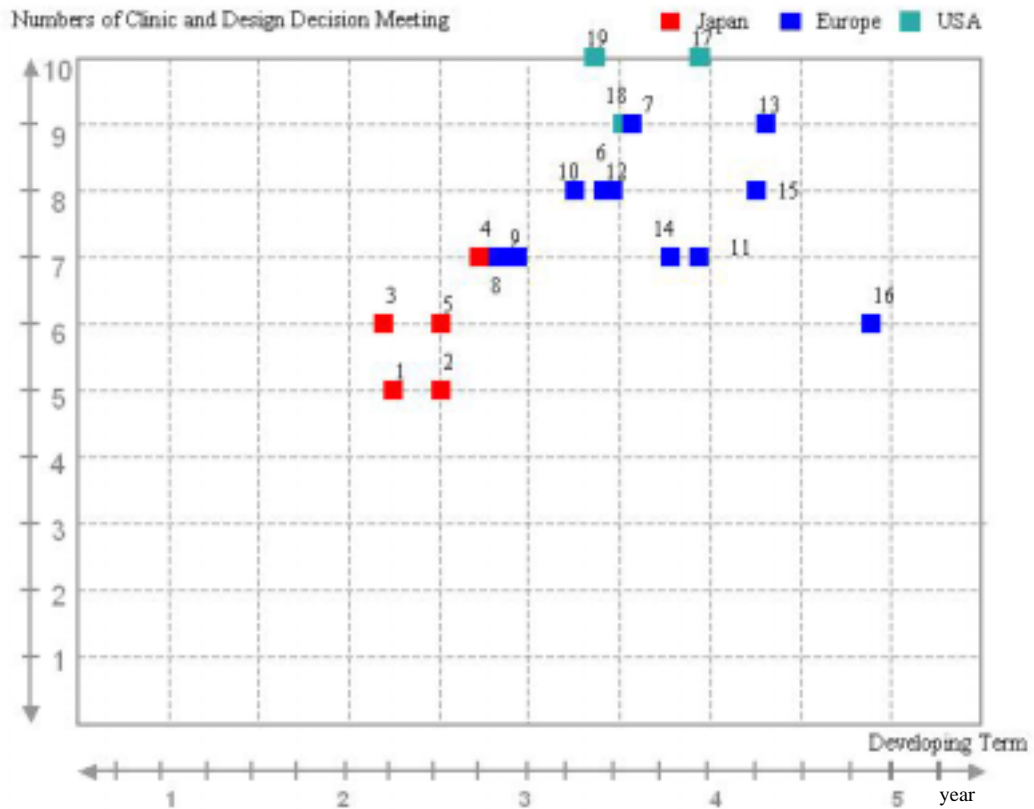


Figure 3: The Relation between Numbers of Clinic and Decision Meeting and Developing Term

And also third analysis, which is the relationship between number of clinic and design decision meeting and developing period, it can be understood that they are related each other, in the other words, the decision-making systems have a tendency to make the development period long. (Figure 4, Figure 6). It can be one of reasons why US firms need long development period.

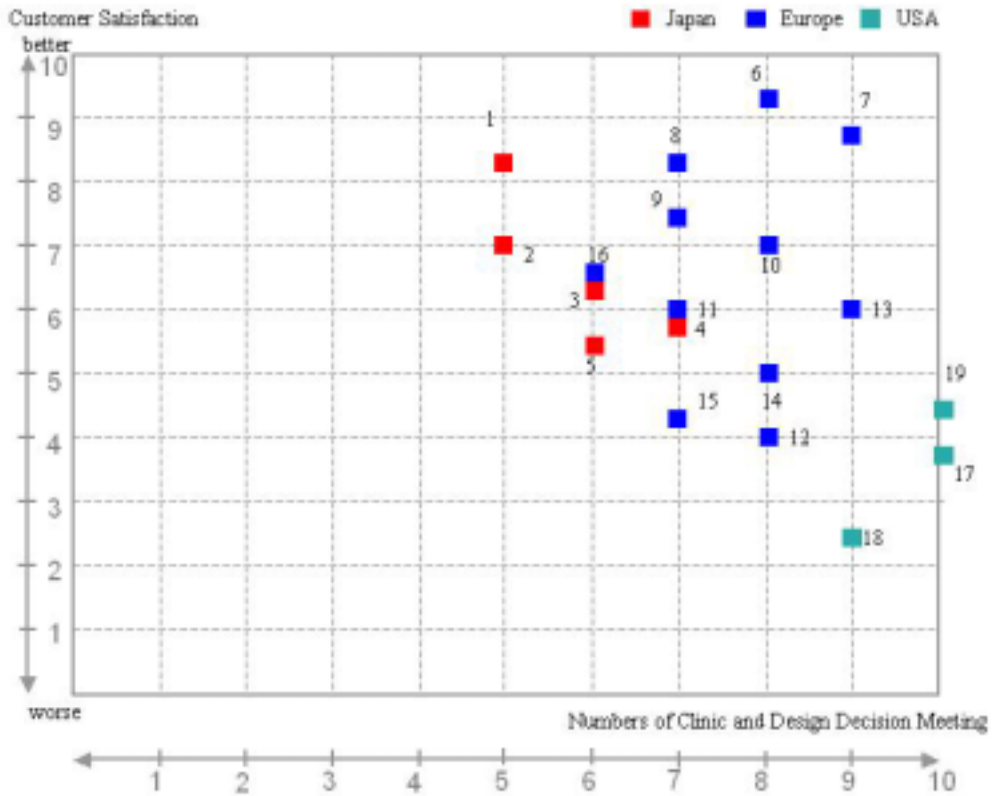


Figure 4: The Relation between Customer Satisfaction and Numbers of Clinic and Decision Meeting

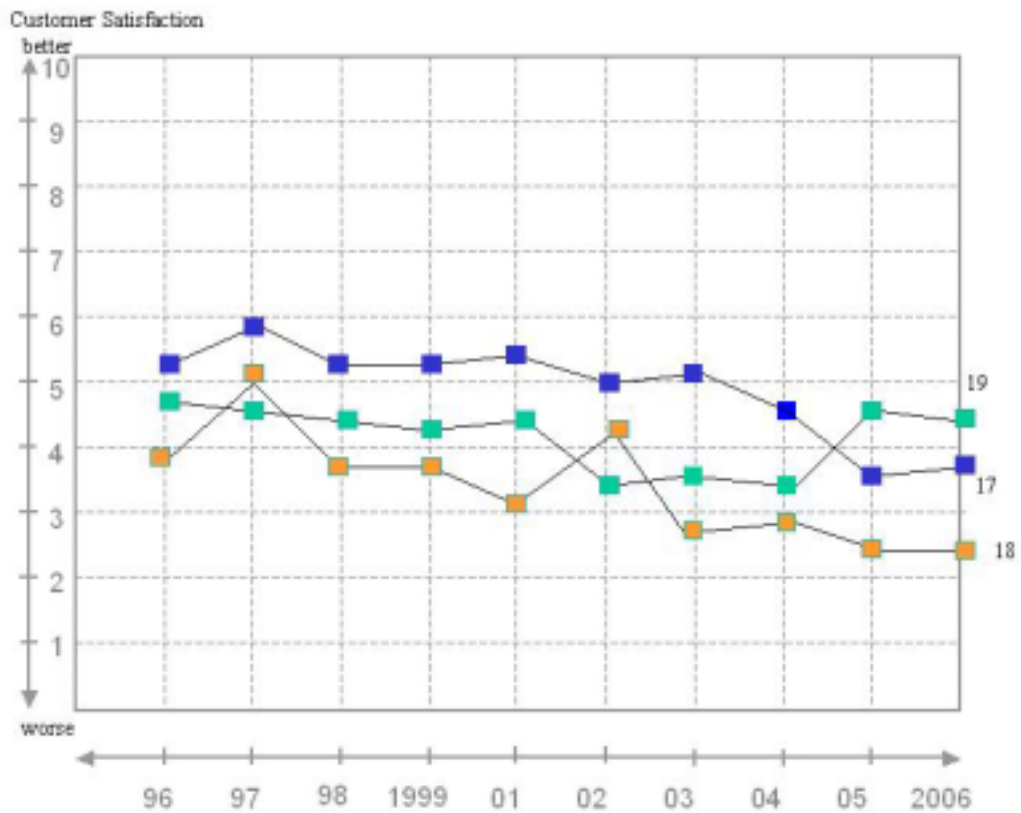


Figure 5: The Progress of The Satisfaction of US Companies

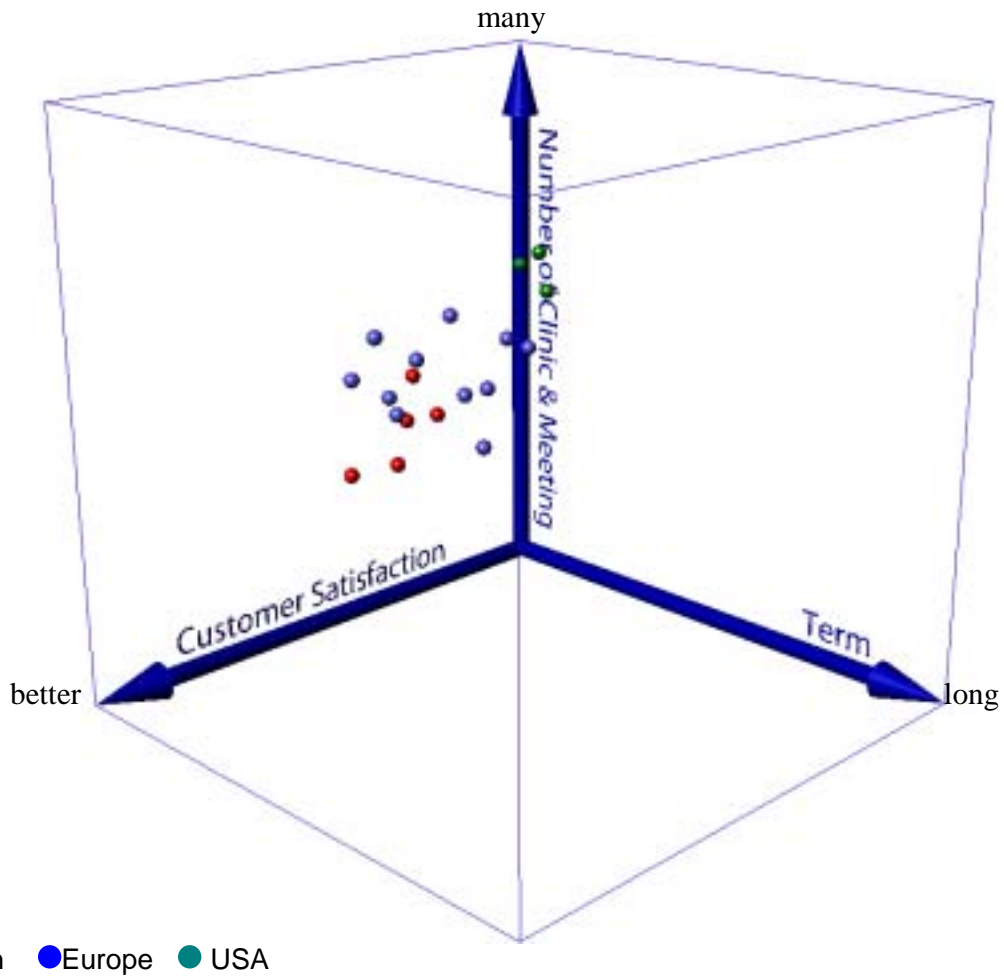


Figure 6: The Relation Among Customer Satisfaction Numbers of Clinic and Decision Meeting and Developing Term

4. CONCLUSION

Japanese firms in general can be said to be more efficient, and to have a shorter product development lead-time. It can be generalized that their corporate performance, as a result of the above, is also better than that of their American and European counterparts. Coming after Japan,

European firms are efficient. Their development process is considerably longer, but their decision-making meetings, held infrequently and with a small number of people participating, lead to efficiency and good corporate performance. Though European companies (especially the German and Nordic firms) differ from Japanese and American firms in that they have consistently adhered for a long time to a development attitude that attaches importance to brand building and quality, they have attained some positive results. The American firms, however, compared to the firms in the other two regions, have longer development lead times. Their decision-making has a lot of steps and takes a lot of time as well. The results have not exactly been good (Figure 6).

In the background of these situations, there are different social systems and sets of values rooted in climate, culture and history. It appears that there are no great differences in the design development functions and processes themselves, but there are differences in the details, of positioning of design in the entire process of product development, empowerment and responsibility, and of a whole concept of design management.

A close investigation into the above will be saved for next time.

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