Invited Paper

A Cultural Perspective on Japanese Strengths and Weaknesses in Operations Management

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Abstract: Nowadays, concepts such as “lean” and “six sigma,” which originated from Japanese manufacturing practices, prevail all over the world as leading edge paradigms in operations management. Practices such as these drove Japan to the top of the IMD international competitiveness ranking around 1990, but Japan’s ranking has since fallen and is recently only in the top 30. Based on an international cultural comparison using Hofstede’s cultural scores, this article claims that these strengths and weaknesses may come from Japan’s culture, in which there is high uncertainty avoidance for objects and time, and which is quite different from not only Western countries but also other Asian countries. This hypothesis is examined by citing our research results regarding cross-national comparisons of CS and SCM performance. Through these considerations, interpretation is provided regarding phenomena currently occurring in Japanese industry considered to be side-effects of high product quality, such as Galapagos and quality homeostasis. Finally, a proposal is made regarding how Japan can overcome the problem and create new quality concepts by taking advantage of its relativistic culture not fixed to a single ideology or religion.

Key words: high uncertainty avoidance culture, customer satisfaction, supply chain management, competitiveness

1. BACKGROUND

1.1 Quality Philosophy and Innovation Concepts Originating in Japan

The basis of operations (work and business) that efficiently secure quality is to develop a standard to accomplish quality, and to work to this standard. However, in Japan, as product varieties increased and product life cycles became shorter, it became impossible to follow these changes simply by working according to the standard. Subsequently, organizational kaizen efforts on the basis of the standard, as shown in Fig. 1, were invented in Japanese manufacturing [1][2][3]. In English, kaizen is called incremental improvement or continuous improvement. Total quality control (TQC), total preventive maintenance (TPM), and Just-in-Time (JIT) or the Toyota Production System (TPS) are considered organizational kaizen efforts aiming at an enhancement of quality, cost and delivery (QCD), and are well known and have been adopted all over the world.

At the same time, many new innovative concepts and new maxims changing the traditional way of thinking were created. Examples of such quality-related concepts include:

- Customer-orientation
- If the quality improves, the cost will also fall
- Source management (“Do it right at the source”)

In addition, in Japanese manufacturing, many innovative concepts were created such as visibility and Just-in-Time, on the basis of the three factors of QCD, now considered global standards in operations management. These became a competitive edge in terms of operations management, and the terms high quality and high reliability spread all over the world in the latter half of the 1980s.

![Quality standard and kaizen](image)

Fig. 1 Quality standard and kaizen.

1.2 Current Problems Regarding Japan’s Competitiveness

However, the situation has changed completely after the economic bubble burst and Japan experienced low growth for long time [4]. Figure 2 shows the changes in Japan’s IMD ranking [5]. While initially maintaining the top rank from 1989 to 1993 after the burst of the bubble, its ranking dropped to 27th in 2002. From this low point, the rank rose gradually, but dropped again to 24th in 2007 and to 27th in 2010. While Japan’s rank has dropped, the United States has continuously occupied the top rank.

What has happened in recent years compared to the period when Japan was ranked top around 1990? The fall may be attributed to lower business efficiency regarding the four

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competitive factors and government efficiency as shown in Figure 2. Another reason is a major change in the IMD's ranking methodology reflecting transition from an industrial to an information society.

![Graph showing changes in Japan's IMD competitiveness ranking.](image)

**Fig. 2** Changes in Japan's IMD competitiveness ranking.

Now let's observe the sub-items of the business efficiency factor and compare the corresponding rankings over time. For instance, in business efficiency Japan was ranked 41st in 2003 and rose to 24th in 2008. In both years, strengths and weaknesses result from similar items.

While "customer satisfaction (CS) management" and "priority of employee training" are strong points in which Japan is ranked near the top, "managers' entrepreneurial spirit," "managers' international experience" and "efficiency of top management" are usually weak points in which Japan is placed close to the lowest rank. As Japan's IMD rank continued to drop, it was pointed out that the profitability of Japanese enterprises is quite low compared to other countries even though Japan is top rank in the number of patents and R&D expenditure, causing the ranking for the infrastructure factor to continue to be close to the top rank even now.

These facts might suggest that Japan's weakness lies in management not taking enough risk and not performing enough entrepreneurial activities. Continuing with management targets such as high quality and increasing market share under the paradigm of industrialization (until 1990) might have caused Japanese managers to neglect new actions needed to adapt to the paradigm shift to an information society. Due to a lack of strategic management, R&D investment and efforts did not connect to financial outcomes. From the next section, Japanese strengths and weaknesses are explored from the viewpoint of inherent culture.

### 2. SOURCE OF KAIZEN EFFORTS: HIGH UAI CULTURE

#### 2.1 High Uncertainty Avoidance Culture for Objects

How can a country's culture be measured? There has been a lot of research on international cultural differences. The basis for this research lies in the four dimensions proposed by Dutch researcher Hofstede [6]. In his famous book, *Culture and Organization*, he mentions interesting insights about country culture as follows:

1. No matter how much globalization progresses and how many new technologies such as the Internet appear, the cultures of countries do not easily converge
2. Many management theories and techniques are only effective under the culture where they were invented
3. Therefore, there is never a single road to excellence in management

There has been a trend for management theories and techniques originating in the United States to be considered the global standard. If Hofstede's above-mentioned points are true, it constitutes a warning against global Americanization. Besides verifying this aspect, let's consider what the features of Japanese culture are. Hofstede's four dimensions of culture are the following:

1. **Power distance (PDI):** dependency of subordinates on superiors. PDI is higher as dependency is stronger.
2. **Individualism (IDV):** degree of connection among individuals. IDV is higher as the connection is looser, and its opposite pole is collectivism.
3. **Masculinity (MAS):** distinction of roles between men and women. MAS is stronger as the distinction is clearer, and its opposite pole is femininity.
4. **Uncertainty avoidance (UAI):** intolerance of ambiguous, uncertain, or unknown situations. Higher UAI implies lower tolerance of ambiguity and uncertainty.

The dimensions were derived based on a survey conducted in the 1970s intended for IBM employees in more than 50 countries. Many researchers have since conducted confirmatory surveys, and the validity of the four dimensions and the scores provided to the countries have been examined and mostly confirmed [7][8].

![Graph showing comparison of Hofstede's cultural scores.](image)

**Fig. 3** Comparison of Hofstede's cultural scores.

Figure 3 shows comparisons of scores for the four dimensions among ten countries including Japan. The Japanese culture can be characterized by mid-range scores of PDI and IDV, and high scores for MAS and UAI. At the same time, it is observed that Japan is not only different from Anglo-Saxon countries such as the United States and Britain, and Scandinavian countries such as Sweden and Finland, but also quite different from East Asian countries in its vicinity such as South Korea, Thailand, and especially China. Cluster analysis suggests that France has the culture closest to Japanese culture.

In terms of management, one should pay attention to
Japan’s cultural characteristic of high UAI. Typical features/ideas that are characteristic of high UAI are as follows: “The uncertainty inherent in life is felt as a continuous threat that must be fought,” “High stress and anxiety,” “What is different is dangerous,” “Students are comfortable in structured learning situations and concerned with the right answers,” “Teachers are supposed to have all the answers,” “Laws are necessary, even if they cannot be respected,” “Time is money,” “There is an emotional need to be busy and an inner urge to work hard,” “Precision and punctuality come naturally,” “Innovations are resisted but, if accepted, applied consistently,” and so forth.

It should be noted that high UAI in Japan makes sense for objects, things, and time, but it never works for concepts such as ideology and religion. In other words, the Japanese have a relativistic culture that is not fixed to a single ideology or religion. There are also other cultural features/concepts in Japan such as “we can go ahead even in vague situations” and “yuzui-muge (flexibility).” This claim is supported by Ryoitaro Shiba’s writings [9], and also consistent with the result of the GLOBE survey [8]. In particular, in Shiba’s books, the terms “relativistic” and “technology-oriented” appear frequently in reference to Japanese culture, where technology-oriented culture corresponds to high UAI for objects.

2.2 Source of Kaizen Efforts: Strengths and Weaknesses

The above-mentioned high UAI in Japanese culture, especially for objects, involves an aversion to uncertainty and an inner urge to decrease it. This might be considered a source of kaizen efforts that other countries cannot easily imitate. Once innovation in operations management was accepted in Japan, it has been applied consistently through technology-oriented solutions. As a result, accuracy, precision, and punctuality come naturally. Due to this culture, organizational kaizen approaches such as TQC and TPM were created in Japan.

Fig. 4 Source of kaizen and a double-edged sword.

In other words, variability or troubles (known as “Murphy”) such as defects and breakdown, are not allowed even initially. Continuous improvement is triggered naturally to decrease “Murphy,” aiming for zero defects and breakdowns as well as a JIT system.

However, as shown in Figure 4, high uncertainty avoidance can easily result in organizational behavior that shows fear of different objects and people, and can cause innovators to feel constrained by rules. This brings about intolerance of diversity, a closed society, behavioral patterns that seek to keep out heterogeneous objects, and a tendency to put people under tight and implicit rules within a group. What conditions might moderate whether the benefits or drawbacks of uncertainty avoidance (Figure 4) have greater weight? As far as observing currently strong and weak industries, at the least, a competitive environment is imperative to move towards the benefits shown on the left of Figure 4.

Goldratt’s famous book on the theory of constraints (TOC) [10] tells us about Japanese weaknesses as well as strengths. TOC can be considered a philosophy of system improvement which was created to overtake the Japanese kaizen approach. While admitting its advantages over the traditional Western approach, Goldratt has two criticisms regarding the Japanese kaizen approach, shown in the speech bubbles in Figure 5, which expresses the five focusing steps of system improvement. It should be noted that the Japanese kaizen approach is considered a short-cut approach from Step 1 to Step 4.

Fig. 5 Five focusing steps and criticisms of the Japanese kaizen model.

The first criticism is that there is no explicit idea to what the constraint (bottleneck) is. The bottleneck in the Japanese approach is not truly the constraint determining the company goal, and is often only statistical variations such as failures or breakdowns that occur unexpectedly but inevitably in manufacturing. Goldratt called this variation “Murphy.” He also noted that Japanese kaizen is never an activity intended for constraint directly, but one intended for the edge of a goal such as inventory reduction and quality improvement. This criticism is reasonable. It is the duty of management to connect improvement efforts with company goals.

The second criticism comes from the fact that Steps 2 and 3, which exploit the constraint fully under its current ability, do not exist in Japanese kaizen. This means a lack of a “status quo” concept or risk management, which would require admitting the existence of variation. Consequently, his criticisms can be summed up as follows: it is unrealistic to conduct kaizen from start to finish aiming at zero failure and zero inventory while denying the existence of “Murphy.”

It is considered that the above criticisms are rational, are critical issues to be reinforced immediately in Japanese management even now. However, conversely, kaizen efforts aiming at achieving zero defects, failure, delivery delays and inventory are Japan’s inherent strength. It is not possible to imitate these efforts and they never function well in other
counties whose cultures are different from the Japanese. As evidence, management tools such as benchmarking and activity-based costing (ABC) were developed and necessitated in the USA as the means to trigger organizational kaizen efforts [11].

3. STRICT CUSTOMER-FORGED QUALITY

3.1 Influence of Economic Situation on CS

On the other hand, how are Japan’s cultural characteristics apparent in consumers? This chapter explores this through a cross-country comparison of CS. The most established determinant of CS is expectancy disconfirmation theory stating that CS is determined by the arithmetic or subjective difference between an individual’s perception of quality and his or her comparison standard (various expectations).

The comparison standard (pre-purchase expectation) that exerts a negative effect on CS is influenced considerably by environmental factors unrelated with the product and service. These factors include information such as advertisements, word of mouth, and changes in the personal capability to buy the product and service. In particular, the economical situation strongly influences consumer behavior. Our research team periodically measured the CS for four home appliances, refrigerators, televisions and washing machines for 30 years from 1977 to 2007.

![Fig. 6 Change in the Nikkei stock index and CS of four market leaders' refrigerators.](image)

Figure 6 shows the change in CS values for four leading manufacturers of refrigerators over time. The bold line is the Nikkei stock index for the same period. The Nikkei stock index represents variations in economic conditions and appears to be negatively correlated with the CS values. If the coefficient of correlation with the average CS value of the four companies is calculated, it shows a highly significant value of -0.907. This tendency is not only common to the television and washing machine markets, but also is observed similarly in hospital CS data and for national-level CS such as the American customer satisfaction index (ACSI) [12][13][14][15][16][17].

Our latest research on the influence of the recent economic crisis on CS for 15 products and services also supports the result [18]. This result implies that meaningful management insight is necessary to remove the bias caused by economic fluctuation when a company’s CS measurement is continuously conducted to judge the company’s performance. The originally measured CS values can be corrected so that they better reflect managerial efforts. In the methodology of this correction, it seems preferable to simply use the stock index among several indices representing the economic situation [19].

For example, in the case of the US fast food chain McDonald’s, let’s consider the correlation of sales and the operating profit with the CS value available in the ACSI database over 12 years from 1994 to 2005. In Table 1, the original CS value means the correlations between the measured CS value and the managerial outcomes (sales and profit) in the corresponding year, one year later, and two years later. In contrast, the corrected CS is the residual obtained by regressing the originally measured CS on the Dow Jones stock index. In Table 1, models 1 and 2 stand for the correlation between the corrected CS value and the three kinds of managerial outcomes considering the time delays. Obviously, highly significant correlations are found with the sales and profit resulting from company efforts in the case of the corrected model by the stock index (model 2).

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3.2 Influence of Country’s Culture on CS

To catch up with Japan’s reputation of high quality, famous throughout the world in the 1980s, many countries took various measures to improve quality. One of them was national-level CS measurement to measure the CS of the country’s companies continuously and publish their values. Today country-wide systematic CS measurements are conducted in approximately ten countries in the world including the ACSI in the United States, the Europe Performance Satisfaction Index (EPSI) in the EU, the German Customer Monitor (GCM) in Germany, and similar measures in Hong Kong and South Korea.

![Fig. 7 International comparison of CS (2003-2005).](image)

Figure 7 shows the cross-country CS comparison of the ten countries’ averages from 2003 to 2005 converted into 100-point scales. An ANOVA of CS country averages across countries resulted in a significant difference of F=69.99 (p=0.000), meaning that CS values differ across the countries.
CS is the highest in the United States followed by Scandinavian countries and Hong Kong. Germany, Japan, and South Korea belong to the lowest group, and there is a difference of ten points or more with the United States. Low CS in Japan does not indicate low quality of products and services in Japan. Instead, it indicates that Japanese customers are severe in evaluating quality. In terms of the expectancy-disconfirmation theory, it means that Japanese customers have high expectations and comparison standards regarding products and services. This phenomenon can be explained by the culture of the country [20].

As for the nine countries excluding Iceland, investigating the correlation between each country's CS value and Hofstede's four dimensional cultural scores shows that UAI has the highest correlation \( r=-0.712, p=0.000 \). As illustrated in Figure 8, a negative correlation is observed. The higher UAI is, the lower the CS of that country is. Since the cultural dimensions are highly correlated to each other, a multiple regression analysis with the decreasing variable method was conducted with five independent variables, the four cultural dimensions and GDP/capita.

Of the two remaining variables, UAI has a highly significant negative effect on CS \( r=-3.578, p=0.002 \), whereas IDV has a positive effect \( r=3.575, p=0.002 \). The CS of a country becomes higher as the UAI score is lower and the IDV score is higher. The contribution ratio is higher than 60\% \( (R^2=0.650, \text{Adj } R^2=0.618) \). This means that 60\% of the CS variations among countries are determined by factors relating to the country's culture, in particular the UAI score. It should be noted that almost the same result is obtained when the regression is conducted using GDP/capita instead of IDV.

One of the crucial factors to enhance national competitiveness is considered to be the existence of highly demanding and sophisticated customers in a country. As Porter [4] pointed out, the severity of Japan's customers, which comes from their inherent culture, has forged Japanese quality. In addition, the fact that CS itself is strongly influenced by country culture implies that one should be careful in international comparisons of CS for the same product or service in a global company.

### 3.3 Cultural Influences on Happiness and IMD Ranking

The negative impact of UAI on CS is also observed when measuring CS at the personal level [21]. Besides CS, the same negative impact is even observed in other satisfaction measures such as life satisfaction (happiness) [22][23][24]. Figure 9 is a scatter diagram of UAI and life satisfaction (LS) for 24 advanced countries where cultural scores are available.

![Fig. 9 Correlation of LS and UAI scores.](image)

If the same regression analysis is conducted using LS as a dependent variable instead of CS, only UAI remains as a regressor and shows a significant negative impact \( r=-4.197, p=0.000, R^2=0.456, \text{Adj } R^2=0.430 \). The model shows that LS is lower as UAI is stronger.

However, there is the difference between CS and LS in the influential mechanism. The cultural impact on LS works through the aspiration level that an individual has internally and genetically, whereas the cultural impact on CS works through the expectation for specific products, services and companies. Therefore, LS may not be influenced greatly by economic variation [25].

![Fig. 10 Changes in CS and LS over time.](image)
p=0.004). The two variables determine about 40% of the variation in the IMD ranking ($R^2=0.456$, Adj. $R^2=0.430$). Figure 11 is a scatter plot where the horizontal axis is the estimated value based on the above model and the vertical axis is the actual IMD ranking score.

![Fig. 11 Actual IMD ranking score and its estimated value.]

The result is almost the same even when using IMD ranking data from different recent years. Current criteria for the IMD competitive ranking may partially explain why about 40% of the overall IMD ranking score is determined by the country's culture. In other words, the current IMD criteria tend to favor individualistic risk-taking and global or open cultures as described in the IMD ranking book of 2006 [5]. The country best fitting these criteria is the United States with high IDV and low UAI.

Although the Japanese government and politicians often refer to Japan's low IMD ranking, the author's opinion is that Japan should not simply aim at raising the IMD ranking under the current IMD criteria. Should Japan pursue countries like Hong Kong and Singapore which have high IMD rankings? Success of these two countries owes to cultural resources and institutions quite different from Japan's. The economic outcome will not be favorable if Japan destroys its culture, which is a source of organizational kaizen efforts, by imitating the institutions of other countries simply to raise its IMD rank [26][27][28].

4. SCM PERFORMANCE, ITS OUTCOMES AND CULTURE

4.1 How Does SCM Performance Influence Financial Results?

Following the topic of CS, let us look at a cross-country comparison and the influence of culture by considering supply chain management (SCM) performance as a representative indicator of operations management. The author developed the SCM logistics score card (LSC), a kind of simplified benchmarking tool, to measure a company's SCM performance in 2002. There are three kinds of LSCs intended for manufacturers, 3PL and distributors. Data collection from companies has been continued by the Japanese Institute of Logistics System (JILS). Benchmark information has been fed back to the responding companies using a database of about 1,000 companies. In addition to the Japanese original version, there are versions in five other languages: English, Chinese, Thai, Korean and Finnish. Data collection has been conducted in countries with these languages [29].

LSC consists of 22 items: five items concerning the strategy and organization of SCM, five items concerning the plan execution capability, seven items concerning the logistics performance and the remaining five items concerning the use of IT. From the 22 items, three invariant factors (dimensions), which are supposed to represent mutually independent SCM capabilities, are extracted. This structure has remained stable even though the data have been increased. These factors are named as SCM organization strategy, responsiveness, and IT utilization ability in Fig. 12 [30][31][32]. It should be noted that these factors are indigenous to Japan as shown later.

![Fig. 12 Three factors and their loading matrix.]

Fig. 13 Mechanism of IT paradox.

Regarding the controversy, known as the IT paradox, about whether investment in IT connects to financial outcomes, a regression analysis was conducted, in which the independent variables are companies' scores for the three factors and the corresponding dependent variables are indices of companies' profitability such as ROA and cash flow obtained from financial reports (NIKKEI NEEDS). Concerning ROA, the result indicates that the interaction of "SCM organization strategy" and "IT utilization ability" has the strongest significant positive influence, while the "IT utilization ability" alone surprisingly has a negative coefficient. Figure 13 shows the obtained response surface on the two dimensions. It is implied that high IT implementation yields better results only when there is an accompanying high-level SCM organization.
strategy. It is not too much to say that the result explains a source of the IT paradox [33].

4.2 International Comparison and Culture

Briefly referring to the results of foreign countries’ LSC data, firstly the obtained factors are quite different from Japanese factors. Except in China, the analysis extracted an integrated factor of SCM organization strategy and IT utilization ability (extracted separately in Japan). This integrated factor is considered preferable and reasonable to avoid the IT paradox and connect SCM performance to financial outcomes [34][35][36].

Secondly, comparing the overall scores of LSC, China ranks highest followed by South Korea, Thailand, Finland, and surprisingly Japan. In particular, Japan is the lowest rank in the item “corporate strategy and inter-organizational alliance”, and this causes the lowest Japanese overall score. It might mean that there is weakness in top management in Japan. Moreover, calculating the correlations with the country UAI scores results in a significant negative coefficient (r=-0.103, p=0.000), that is, SCM performance is lower as UAI is higher.

4.3 Reverse effect of strong “Genba”

Another interesting Japanese feature is observed from gap analysis. This is one of the functions of our diagnosis system, and visualizes the awareness gaps for the SCM performance of one’s own company based on responses by several members belonging to the same organization. The same tendency is observed; the higher the member’s hierarchy, the higher the score is. In other words, the score is lower and the evaluation becomes more severe as a member becomes closer to the front line. Figure 14 shows an example [37].

Fig. 14 Example of LSC gap analysis in Japan.

On the other hand, the result is opposite in foreign countries. Figure 15 shows an example of a Western foreign-invested enterprise in Thailand. This contradiction between the Western and Japanese results is caused by the fact that in general, those in “the field” (genba) (front line) never work well unless higher management controls them well. The Western results reflect this fact. In contrast, it is said that the Japanese genba is very strong and autonomous, and strong control actually harms their autonomy. This tendency is observed even in a gap analysis using the new product development score card (NPDSC), developed for measuring NPD operation capability corresponding to the LSC purpose [38][39][40][41][42][43].

Fig. 15 Overseas example of LSC gap analysis.

5. CONCLUDING REMARKS

Japan’s high uncertainty avoidance culture for objects and time was a source of not only high quality and high reliability of products but also kaizen and strong genba resulting from a culture where precision and accuracy come naturally. At the same time, Japan has been facing phenomena exclusive to Japan. Examples are excessive responses to food safety violations and unexpected accidents. This is considered a side-effect of high quality and high reliability, and has caused high costs in service industries. For example, Japanese citizens tend to seek unrealistic levels of safety. In addition, Japan experienced the so-called Galapagos phenomenon [44] of competing for high quality and many product functions within the country. Another example is the phenomenon known as quality homeostasis in which consumers accustomed to failure-free products face unexpected accidents when using the same product for 30 years or more without maintenance.

It is said that the prevailing paradigm has changed from cost to quality, and is now changing to design. Considering this trend, it is necessary to define a new direction for the improvement of Japan, besides the improvement of management skills. In particular, this is necessary to succeed in the huge emerging markets of BRICs and VISTA. The new direction may be a creation of a new quality concept based on a culture of respect to all kinds of objects [45], or a redefinition of what quality should be in accordance with diversified global markets.

Japan must maintain the strength of high uncertainty avoidance so as to trigger kaizen efforts. On the other hand, Japan must now exert another aspect of cultural strength: great tolerance to ideology. If Japan can take a new direction such as “environment-founded country” in addition to “quality-founded country,” it may reignite its development based on its cultural strengths.

REFERENCES