

TOTAL QUALITY MANAGEMENT IN THE INTERNET ERA

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Abstract

Quality management was originally started as a means of the manufacturing company's reducing the failure rate of the standardised mass products during the 1930s. As competition between companies became stronger in 1980s and the customer's needs were diversified, the product-centric quality control was transformed into the today's total quality management (TQM).

However, since the early 1990s the business environment has radically changed together with the appearance of Internet technology. Internet caused industry to create new markets extremely different from the past. The Internet technology enabled to change internal business processes into customer-focused ones. Therefore, the company which sticks to the past management style would not survive any more. As far as TQM is concerned, exception does not also exist. If the company applies the existing TQM methods without considering the Internet's influence, it will be suffering from considerable problems rather than creating corporate value. Some publications therefore tend to insist that TQM is not appropriate in the Internet era.

Contrary to this, the paper suggests that TQM can be developed and implemented more effectively by considering the changed environment. TQM aims to satisfy diverse stakeholders' requirements. This TQM principle will never vary over time, even in the Internet era. TQM can be further improved by supplementing its core areas in the new environment. In a sense the paper will review the principle of TQM and analyse difference between the past industry and the new Internet one. The core TQM areas that should be more highlighted in Internet era will be described in detail with some relevant cases. The areas for improvement and their solutions will be explained regarding the business excellence model.

Change of the management environment and TQM

TQM needs both the reasonable management approach and scientific quality control techniques to standardise, improve and innovate the business processes. Under the support of top management, it highly values the continuous education and training as well as every employee's participation. TQM aims to satisfy the customer's needs, finally achieving the company's long-term growth. This TQM model consists of such areas as basic philosophy, system and techniques (1). The model also includes top management's leadership, continuous improvement, and education and training that are called the common principle of moving the overall business.

The TQM program needs to stick to the basic philosophy described in Table 1 and to

adjust to each industry or company's intrinsic environment. Internet will cause to greatly change the market or business pattern and the consumer's behaviour. Accordingly, some problems will be incurred when applying the existing TQM model developed in the past business environment. However, it is felt that TQM will continue to develop more and more by repeating trial and errors as adjusted to the change of the business environment since 1930. The insistence that TQM will be a pad seems to be too narrow-minded prejudice, considering that the current TQM aims to improve overall business, not product-oriented quality.

<Table 1> Basic philosophy of TQM

Basic element	Details
Customer focus	Customer determines quality
Prevention first	Problem is prevented beforehand
Employee's participation	Every employee or department is involved
Management by fact	Performance measurement and analysis is based on data
Process improvement	TQM pursues continuous improvement and innovation
Employee respect	The internal customer's satisfaction leads to the external one
Partnership	TQM aims to increase the stakeholder's interest

Before organizing the appropriate TQM strategy to the Internet era, Table 2 compares difference between the traditional and Internet's business environment in terms of organisational design, customer management, business strategy, process improvement, management's role. This shows that business environment can be summarised as uncertainty, velocity of light, diversity and cyberspace. The traditional business model is quite formalised because of doing business based on the physical assets it is called 'Bricks and Mortar.' Meanwhile, Internet business using the Internet technology is developing into more diverse patterns when compared to the traditional model. This is due to the fact that Internet business uses only mouse and click on the cyberspace without the real object. So it is called 'Clicks and Mortar' (2).

Physical asset is classified as product in the traditional business whereas invisible one is service. However, it is unclear to make difference between product and service in the Internet business because trade is made on the virtual space. For example, it is quite difficult to judge whether a music CD transmitted into a MP3 file is product or service. The Internet business enables company or customer to make a direct trade on the cyberspace. Therefore, it has short channel of logistics without an interim points such as the wholesale or retail markets. The consumer can indefinitely choose high quality products with low cost because Internet business displays different services on the web. The Internet company enables to sell products or services anywhere and anytime in a globe without the constraint of time and space.

Benchmarking

<Table 2> Comparison of between Internet and traditional business

Characteristics	Traditional business	Internet business
Organisation	Pyramid	Web or network
Organisational design	Well structured	Chaos itself
Product	Physical and visible	Digital and invisible
Consumer preference	Off – the – rack offerings	Customised solutions
Logistics channel	Multi steps	Company/consumer
Marketing activity	Mass sale of few products	Small sale of multi products
Collecting customer needs	Sales staff	Via online
Response to customer	Relatively slow	Real time
Business strategy	Three year business plan	One month business plan
Process improvement	Incremental	Revolutionary
Corporate core assets	Physical assets	Knowledge
Saving operating expenses	From scale of economy	From decreasing stock
Manager's role	Adapting	Self control
Personnel management	Focus on total employees	Focus on key employees
Corporate culture	Closed	Open

Internet business can immediately respond to the customer's complaints because of collecting the relevant customer information via online. On the other hand, the traditional business is slow responding to the customer's complaints because marketing staff directly collects the customer-related information. Unlike the traditional business needs mass investment on estate, Internet business may succeed with small investment if its business model or idea is excellent. Accordingly, Internet business should focus on increasing the corporate value by managing information and knowledge more than physical assets.

Total quality management in an Internet era

As reviewed above, the Internet business is quite different from the traditional business from the viewpoint of market environment, business pattern and consumer preferences. Accordingly, both online and offline companies should establish a TQM strategy considering the changed environment in an Internet era. TQM should continue to be developed into an important innovation program of increasing efficiency of overall business by reflecting its basic concept as well as the intrinsic characteristics of Internet business. For this, key elements of TQM that should be either supplemented or emphasised in the Internet era will be reviewed in terms of product, process and people management as suggested by Hammond (3). Some cases are suggested to explain the characteristics of the Internet business.

Product management

The main focus of TQM is customer from the viewpoint of the product management. Namely, TQM aims to fully satisfy customer's requirements. As far as quality of the product or service is concerned, the traditional business pursues consistent quality rather than customisation because of emphasizing the mass production of a few products. Ac-

Accordingly, all activities including production, delivery, after-service, etc are carried out according to the prepared standard or procedure. For example, the customer satisfaction program at the customer interface tends to be implemented either passively or formally in some companies. In case that this fixed TQM program is continuously implemented in an Internet era, consumer's changing needs can not be reflected on time.

The company can survive when thinking and behaving customer centric. The first step for success is to develop the website attracting the customer's interests so the consumer's satisfaction is most important. For example, reflect.com, spin-off of Procter & Gamble, is an online cosmetic company that succeeded from intensifying customer management through mass customisation. The customers were required to directly submit their skin conditions and colour preferences to the company. This enabled the company to design individually customised products based on fifty thousand combinations of cosmetics and perfumes. The company can charge a premium price because most cosmetics are produced according to individual customer's order.

Mobil made a large amount of profit and also secured loyal customers by supplying new type of customer services using Internet technology. The drivers are required to swipe their credit card against the gas tank before they fill up. This caused to remove customer's inconvenience waiting to pay at the counter. The key that Mobil became more competitive than the rival Exxon was not quality nor price, but the new business model of supplying the customised services. This proves that the Internet business should focus on establishing new relationship with individual customers (4).

The existing commercial transactions tend to spend a large amount of money on marketing advertisement. However, Internet businesses enable to attract considerable community members for a short time of period. If small company with low brand reputation utilises mouth-to-mouth marketing well, it will be able to enjoy considerable benefit compared to the spent resources. Meanwhile, although any Internet company attracts the customer's temporary interest or acquires large number of fixed visitors, it is impossible to continue to gain profit without developing the next promising alternatives. For example, American women site, women.com with 450,000 visitors did not gain any obvious revenue sources so its stock price fell to bottom.

Accordingly, improvement effort is endlessly required for diversifying the type of commercial trade and increasing the products of meeting the customer's needs. As a creator of reverse auction, priceline.com that started business of selling the flight ticket has made an effort of increasing the number of their service products. The company is now dealing with retail products and gasoline.

Process management

Speed is the key of determining competitive power in the Internet business. Although quality of product is important, it is more necessary to get the premium of the first runner by preoccupying market ahead of the rival company. This means that the second company of doing the Internet business is not well recognised by customers. Hammond (3) insists that the DC(do, change) strategy is efficient, meaning "fail first, do it better the

Benchmarking

second time.” Innovation is more desirable than gradual improvement. The competitor’s killer application can cause to remove the competitive advantage accumulated to date. In general, the Internet company tends to try either the merge and acquisition or the strategic alliance with other company for the rapid entry to market so it is necessary to intensify the partnership management.

Compared to the traditional business, the advantage of doing Internet business first is beyond imagination. The company of doing the traditional business can enjoy the first runner’s advantage when it precedes its rival company at least one year. Meanwhile, the Internet company of going ahead one month only can enjoy much more benefit than the follower. Accordingly, providing service of the new business model speedily is more valuable than developing and selling the perfect service late. This emphasises that the problems of the business model can be fixed in the middle of doing business.

Therefore, the Internet company will not survive with three to five year long-term business plan like the telephone company. As Yahoo is carrying out one month plan, the internet company needs to flexibly react to the unpredictable change of the business environment by anticipating its shock in the future. At the same time, the Internet company is required to take advantage of the smart and speedy organisation by combining speed with knowledge. For this, the Internet company should simplify the business processes to reduce repetitive tasks. The company needs to maintain the core employees only by outsourcing all tasks except the key areas. Designing the business model module by module will help the company to make a flexible response to the customer’s changing needs.

The successful companies have their own core competencies differentiated from others. In addition, they are holding their own fixed ideas and bad habits formed for a long time, which tends to prevent innovation required in an Internet era. For example, many offline companies try to either introduce Internet technology for improving the business processes or to advance into the online business. This is frequently stopped due to the resistance of the relevant stakeholders such as internal employees, trade union, retail shop and supplier (5).

Any company using the Internet technology is likely to improve productivity. The existing offline company may also enjoy enormous benefits from network technology. The larger company the higher productivity. Enron’s success was possible because its visionary leader took advantage of a new opportunity of Internet technology. Enron used to transport the natural gas but completely transformed to the energy and communication company by using network technology. Many products such as oil, natural gas, power and broadband communication are now being transacted more than nine hundred times every day in EnronOnline established by Enron. The company turned out thirty percent increase in sale during the second quarter 2000. Enron’s marked performance was possible because of its top management’s entrepreneurship to drive the great change (4).

Human resources management

The TQM program can be efficiently working when the organisational and personnel

management inspires employee's creativity and motivation for innovation. The traditional company has a large organisational map with the powerful CEO on its top. Meanwhile, because the Internet business shares information and participates in decision making via Internet, it can be said that either network or web is quickly replacing the traditional pyramid structure. As the boundary between organisations is rapidly collapsing, formless organisation will be generalised in the near future. This will be more accelerated due to the expansion of outsourcing, strategic alliance, spin-off, etc.

Each employee's competency gets more important in the Internet business so the organisational management should focus on increasing close communication between employees. Intranet enables every employee to express their opinions or ideas anytime, which helps to strengthen the communication channel in a company. For example, CEO of American Trilogy continues to have one to one conversation with employees via Internet. One and half thousand employees can approach top management's business direction and evaluate their managers' business competency. Therefore, employees can feel that they are working as a partner with top management, not employment relationship.

Business excellence models in the Internet driven industry

Since the late 1980s, some countries have introduced the business excellence models (BEM) to implement the TQM programme. BEM originated from American Malcolm Baldrige National Quality Award (MBNQA). Europe then introduced the European Quality Award model. Other countries like Japan, Canada, Australia, Korea initiated similar Award models to the MBNQA and EQA. However, TQM philosophy has certainly formed key of the business excellence models. Therefore similarities between TQM and the BEM criteria are no accident. Today, the business excellence model is called the textbook of TQM.

The business excellence models encouraged strategic initiatives in the approach and deployment of quality practices. They were used as a standard of implementing a quality strategy, benchmarking best practices, performing self-assessment and, ultimately, achieving performance improvements toward excellence (6). The industry enabled to improve performance practices and capabilities and to facilitate communication and sharing of best practices among organisations. For example, the European Quality Award was developed to honour outstanding European business. Its criteria are comprised of enablers and results. The quality improvement enablers include five categories; leadership, people management, policy and strategy, resources and processes. Effective implementation of the enablers impacts the results categories – people satisfaction, customer satisfaction, impact on society and business results.

Despite the continuing availability and popularity in the private sector, public sector or supply chain world, the business excellence model focussed on other more narrow mandates and imperatives that seemingly require a different approach. In general, Internet-driven organisations have not applied a business excellence approach out of the urgent demands of Internet time, limited staff and financial resources, and the short-term prize of

Benchmarking

striking it rich (3).

In general, it is argued that the failures of the TQM programme are mainly due to the process by which the TQM philosophy is implemented rather than flaws in the principles of TQM itself (7). According to Fuchs (8), TQM program fails because of two major causes that are both a lack of strategy planning and a lack of an appropriate culture supportive of TQM programs. He argues that TQM programs must be implemented within a framework that includes the strategic intent and the cultural characteristics of the organisation.

The relevant problems to strategy planning are lack of a formalised strategic plan for change, view of quality program as a quick fix and the drive for short-term financial results. On the other hand, the culture issues are lack of a customer focus, lack of real employee empowerment, lack of trust in senior management, lack of leadership, poor communication and lack of a quality definition. In addition, major problems includes failure to link management compensation to the achievement of quality goals, inadequate employee training, inadequate resources for employing quality management and time constraints (7).

Some problems encountered in the traditional industry can not be exceptional in the Internet organisation. However, the business excellence models have some more limitations. They lack flexibility in applying in the Internet industry. Basically, they follow the PDCA concept as the RADAR logic forms the heart of the European Quality Award model (9). The RADAR logic states an organisation's needs to:

- Determine the **R**esults aimed for as part of its policy and strategy making process
- Plan and develop an integrated set of sound **A**pproaches to deliver the results
- **D**eploy the approaches in a systematic way to ensure full implementation
- Assess and **R**eview the approaches.

The RADAR scoring matrix is designed to grade excellence of approach, deployment, assessment and review evenly from 0 to 100%. Such complex approach can not be applied to the Internet company which is subject to time constraints. The Internet company should raise benefit by shortening time to market. Therefore, more weight should be given on Deploy, Assess and Review for the Internet industry. This will cause the Internet company to focus on action and checking much more than planning.

The business excellence models have another limit to assessing the Internet company's ability in terms of responsiveness, creativity, increasingly important customer expectations. The business excellence model is a formalised management standard to reflect best practices pursued by the super excellent companies, not the Internet company. In particular, the business excellence models can be well applied to the pyramid organisation with functional hierarchy rather than web or network organisation that prefer exceptionalism to conformity (3). Therefore, if the business excellence models themselves are applied to Internet industry, many problems may be incurred without gaining any benefit. Several areas for improvement will be emphasised so that the business ex-

cellence models continue to be effective in the future.

TQM should focus on building new customer relationship by supplying the customised services for individual customers as proven in two cases such as reflect.com and Mobil. Customers now want to be viewed as individuals. Mass customisation should be preferred to mass production. In addition, although the current business model is so excellent to produce high performance services, the proactive TQM strategy should be established for continuously developing the customer wanting business model. This is the best way to prevent customer's departure. CRM (customer relation management) can be therefore used as a useful tool in the Internet era.

From the viewpoint of process management, speed should be emphasised as a key element in the Internet business. The shorter time to market, the higher benefit grows. An effort is required to quickly detect and fix the operating problems after starting business first. A short-term strategic plan is therefore preferable to long term plan. This is possible when all areas except competences are supplemented by the strategic alliance and outsourcing. The innovation culture transcending the business boundary should be formed to enjoy enormous benefits gained from Internet, not continuous improvement.

In particular, leadership is essential to accelerate innovation programme. The senior managements should serve as a role model, reinforcing values and building leadership and initiative through the organisation. Therefore, investment in leader should be considered top priority. It is necessary to design the leader's future profile in the areas of innovation initiation, performance enhancement, goal setting, communication, personal style, etc. The organisation needs to align its strategies, systems, styles and structures with its values and the needs of its customers. If a company's culture is not conducive to total quality, culture must be changed before a total quality program can succeed.

The Internet organisation's success in improving performance depends heavily on the skills and motivation of its workforce. Employees need to have opportunities to learn and practice new skills. Information and knowledge should be managed more important than physical assets. It should be also remembered that five percent excellent people lead the remainder 95% employees.

The Internet organisations should also seek to build internal and external partnerships to better accomplish their overall goals. Internal partnerships might include those that promote cooperation between labour and management. External partnerships might be with customers, suppliers and educational organisations for a variety of purposes, including education and training.

Therefore, performance management should focus on managing core employees than people in general. Knowledge creation should be dealt with as a key of performance management. Performance based compensation such as stock-option and profit sharing will contribute to stimulating individual's participation to innovation program for performance enhancement. In addition, time to market can be used as a performance measure associated with process management. In particular, market-share or share-value

Benchmarking

may be more appropriate measure than profit or EVA (economic value added) because the former well reflects the future value of the Internet organisation. The customer satisfaction measures should be designed to focus on raising percentage of loyal customer or percentage of customer to repurchase.

Discussions and conclusion

In an Internet era, either company or customer can directly transact products or services on cyberspace without any intermediary such as market and showroom. Customers can enjoy considerably infinite choice of product or services because a cyber trade transcends national boundary or time. The existing TQM programme should be transformed into an important innovation program by reflecting the intrinsic characteristics of the Internet business. From this point of view, the core elements of Internet TQM model will be again summarized.

Firstly, Internet business should focus on meeting individual customer's needs. Company's success depends on supplying large number of differentiated customer services. Internet business should avoid the passive concept that customers are serviced like the past industry. Instead, the TQM program must emphasise the customer relationship of considering customer as a business partner. A TQM strategy should be established so that customer focus is much more reflected in the business model.

Secondly, it is important to gain the first runner's advantage at maximum by advancing into market first and fixing the operating problems swiftly. Both online and offline companies need an adventurous sprit of applying Internet technology to change the business processes into customer focussed ones. The top management's determined decision is required so that they would not repeat American bookshop's mistakes caused by the sudden appearance of Amazon. The traditional company tends to either ignore stakeholder's changing needs or neglect innovation, satisfying with the past success without reflecting the changed market. Such company will finally weed out in the Internet era.

Thirdly, both organisational and people management should be focused on swiftly responding to customer's needs. Every employee's creativity and motivation should be promoted by changing the hierarchical and functional organisation into the flexible organisation, which makes it possible to actively respond to any environmental change.

Lastly, the existing TQM principles should be continuously observed in the Internet era. Strong leadership is responsible for creating a company vision and culture that reduce the resistance to change among employees. The role of organisational leadership in communicating a vision is extremely important since successful implementation of TQM initiatives requires a supportive culture. The ingredients of a culture supportive of TQM include shared values and beliefs, trust and mutual respect, empowered employees and an attitude favouring continuous improvement.

As customer expectations increased, quality evolved both from a product specific focus

to an company-wide effort and from a separate manufacturing function to a strategic business initiative. In the future, TQM will be also developed into a innovation programme of comprehensively satisfying diverse stakeholder's needs. By considering the changed environment of the Internet era, the TQM program will have to focus on increasing total quality with regard to product, process and people.

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