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ENGLISH COMMUNICATION NOTES

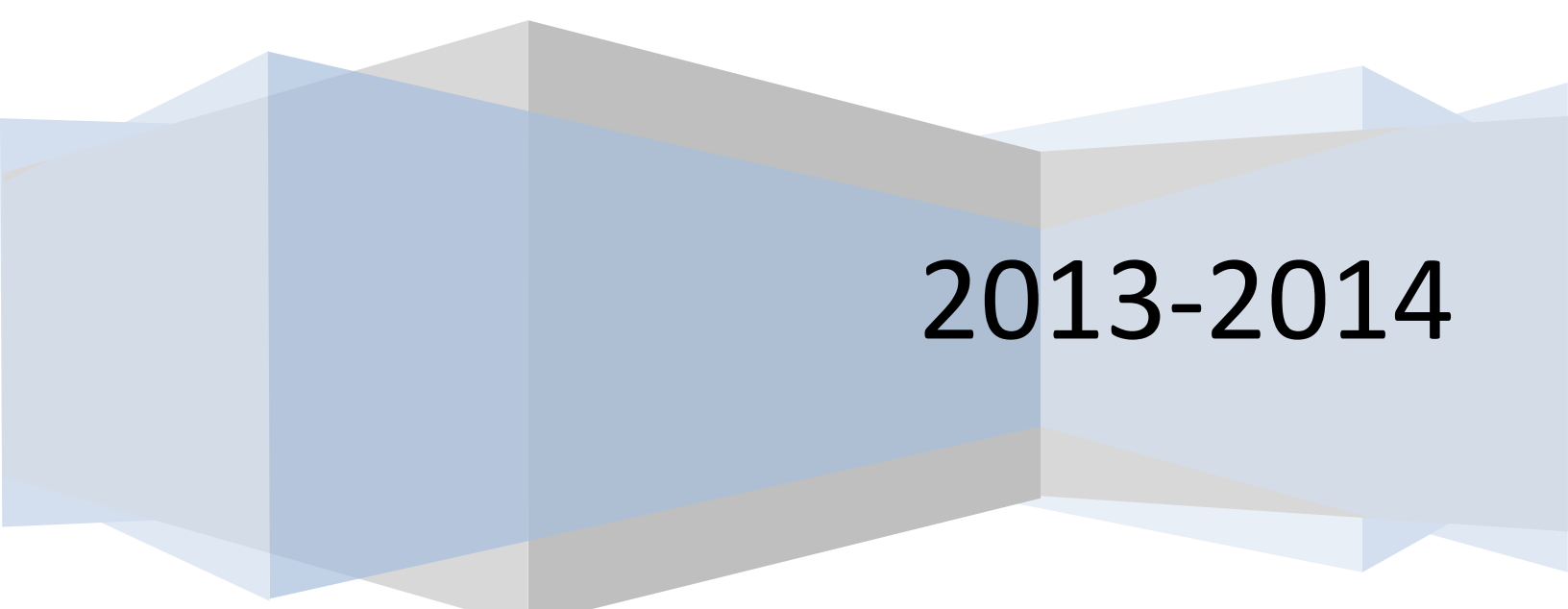
IN

LOGISTICS MANAGEMENT

BY

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Levels: English Terminology I & II



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Welcome Note

Dear Student

Welcome in the course of English Terminology I & II of Logistics Science.

The aim of this academic workbook is to expand your knowledge in the science of Logistics in the English language and help you familiarize with the core concepts in Supply Chain Management from different perspectives in a critical manner.

By the end of this learning journey you will have a clear idea of what the current issues in the business of Logistics. You will also be able to express and justify your views in these issues following main relevant theoretical models. Finally, you will strengthen your leadership and negotiation skills.

Enjoy this journey!

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UNIT 1

HUMAN RESOURCE MANAGEMENT in SCM

Supply chain: HRM

Connecting the workforce

By Dr Ann Vereecke¹

ARTICLE | 18 JULY, 2012 - 10:03



Many companies overlook the various benefits to be gained from applying human resource management practices to supply chain management.

The globalisation of business, characterised by increased outsourcing, has firmly placed the spotlight on supply chains. It is commonplace for large corporations to have their supply chains scrutinised, especially when setting up factories in poor countries, in order to ensure there are no incidents of sub-standard employee conditions. However, along with this scrutiny has been a surprisingly low level of innovation in terms of new ways to improve supply chain management (SCM). One such area that is frequently neglected is the value that human resource management (HRM) practices can offer to a supply chain.

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A brief look into previous research shows that little has been written on the relationship between HRM and SCM. Despite the two practices essentially having the same goal of improving organisational performance and enhancing overall business strategy, they have both evolved along separate lines and adopted their own philosophies. However when considering the similar challenges faced by these two areas of management, it is clear that HRM possesses the ability to improve SCM as a whole.

Fundamental to this view is the often overlooked fact that the successful management of a supply chain rests predominantly on the performance of people. For some supply chain managers it is enough for them to concern themselves with the machinery of making the supply chain work. Effort is concentrated on choosing new factory locations or acquiring new transport methods for goods. Overlooked throughout these decisions is the fact that it is the people operating within these factories or transportation that are responsible for creating a productive supply chain.

Once businesses come to the realisation that managing the people in a supply chain is as important as managing overall strategy, then the incorporation of HRM is sure to produce results. Also, integrating the two disciplines could help overcome the frequent complaint by HRM managers that their strategy does not get aligned with that of the overall business, and can in fact produce a number of progressively broader benefits.

Initially, firms need to start by breaking down the HR requirements of the supply chain. If you are to start outsourcing business to a different country or region then you need to establish whether or not the available workforce have the relevant skills required for that particular role. This presents the opportunity to use established HR training methods for the needs of supply chain firms. If your business has developed a training scheme that is consistently producing a more pro-active and effective workforce, then it makes little sense not to take full advantage of this. Training schemes should be sold or shared with supply chain partners; and the practice of HR should enable you to identify the specific training requirements of each partner firm. By doing this you are not isolating the benefits of a training scheme to one section of your supply chain: instead, all partner members will experience the improvement in workforce productivity from training.

Another established HR practice is that of the incentive. To ensure employees are working at full productivity, incentives are set in place such as guaranteed pay rises for meeting agreed targets or bonuses for completing projects in certain timeframes. In doing so, workers are inspired to conduct themselves in a manner that expedites the growth of a business. This practice is surprisingly neglected when it comes to the management of supply chains. It may already be common for service level agreements (SLAs) to be set in place, where for example if a firm supplies 100 per cent of orders on time for an entire month then they receive some form of remuneration, however there is no reason why this should not be translated directly into

incentives for individual employees in the supplier's company. If the employees receive the benefits of meeting the firm's overall SLAs, then they are being incorporated further into the overall business strategy and are motivated to achieve targets for the benefit of both themselves and the business as a whole.

The use of incentives can also be practiced when recruiting supply firms to partner with. When HR managers attempt to source the best possible talent to recruit into a company, incentives in pay and other contractual benefits are offered to attract a prospective employee. The same can be applied when searching for the best possible supply firms with the most impressive track record of successful delivery or production to incorporate into your supply chain.

In essence, collaboration and sharing of HR principles is what is vital. If, for example, your business has a desirably low turnover of staff and staff retention is not an issue for you, whereas one of your supply chain firms suffers from high turnover rates, then sharing HR practices with supply chain firms will help to stabilise this. Also, in terms of recruitment it makes little sense to refuse to share applicant pools with supply chain firms. While your business is recruiting, advertising globally or in different regions will allow you to pass on relevant talent to your supply chain firms, thereby enhancing the quality of their workforce by delivering talent that on their own they may not be able to attract.

The benefits of fully incorporating HRM into SCM can lead to a business with a clearer definition of its overall strategy. If companies can employ HRM practices to align an entire connected workforce then the long-term improvements in productivity and efficiency should be enough to convince businesses to re-think the relationship between human resource and supply chain management.

UNIT 2

CUSTOMER RELATIONSHIP MANAGEMENT in SCM

The CRM Customer Relationship Management Frameworks/Models

A various range of comprehensive Customer Relationship Management CRM models have been developed. The author introduces five of them in this chapter.

THE IDIC Model

The IDIC is described as below (Figure 2.6)

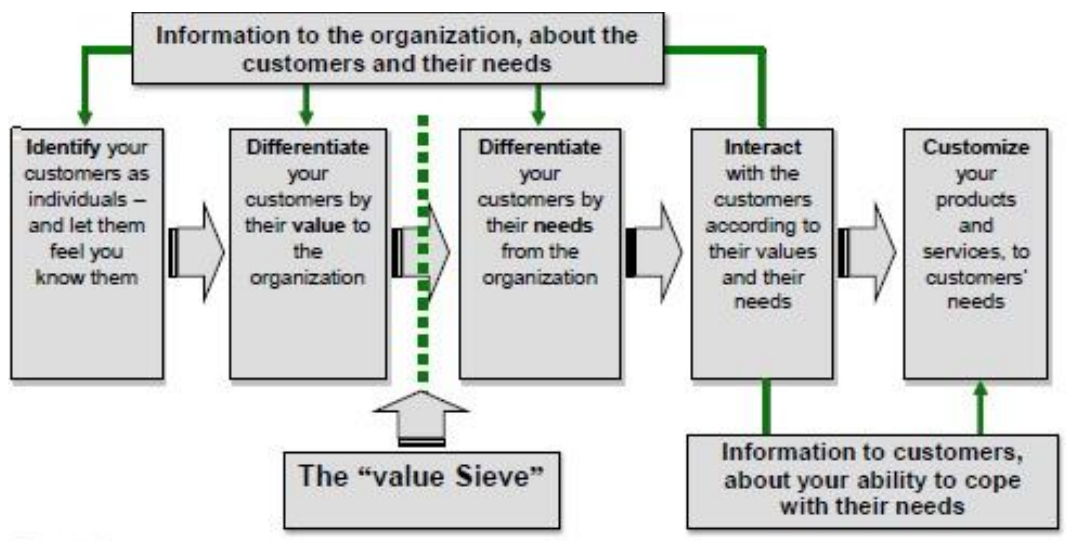


Figure 2.6: The IDIC Methodology (Peppers and Rogers, 2004)

The IDIC Model has been developed by Peppers and Rogers (2004) According to IDIC model, companies should take four actions in order to build closer one-to-one relationships with customers:

- **Identifying** who the companies' customers are and building a deep understanding of them.
- **Differentiating** their customers in order to identify which amongst them have most value now and which offer most for the future. Besides, the differentiation can allow the companies to devise and implement customer specific strategies designed to satisfy individually different customer need.

The clients represent different levels of value to the company and their needs are radically not the same from the enterprise. According to Peppers and Rogers (2004), the customer differentiation task will involve an enterprise in categorizing its customers by both their value to the firm and by what needs they have.

- **Interacting** with them in order to ensure that companies understand customer expectations and their relationships with other suppliers or brands. Thus, companies must improve the effectiveness of their interactions with clients. Each successive interaction with a customer should take place in the context of all previous interactions with that customer. A conversation with a customer should pick up where the last one left off. Effective customer interactions provide better insight into customer's needs.
- **Customizing** the offer and communications to ensure that the expectations of customers are met. Indeed, the company should adapt some aspect of its behaviour toward a customer, based on that individual's needs and value. To involve a customer in a relationship, a company needs to adapt its behaviour to satisfy the customer's expressed needs. This might entail "*mass-customization a product or tailoring some aspect of its service*" (Peppers, Rogers and Dorf, 1999).

The Quality Competitiveness Index Model (QCI)

QCI are independent specialists who assist blue chip companies in managing customers. They are both strategic theorist and foremost practitioners (Hewson et al, 2002). The QCI model shown below is described as below.



Figure 2.7: The QCI Customer Management Model (Hewson et al, 2002)

The above is described as a customer management model, omitting thereby the word “relationship”. At the centre of the model, they highlight a range of activities needed by companies to perform in perspective to acquire and retain customers. This model also features people performing processes and utilizing technology to assist in those activities.

The Customer Relationship Management CRM Value Chain Model

The CRM value chain (figure. 2.7) is a model which businesses can follow when developing their CRM strategies (Buttle, 2004). This model had been developed by a range of SMEs such as IT, software, telecoms, financial services, retail, media, manufacturing, and construction. This model is built from strong theoretical principles and the practical requirements of business.

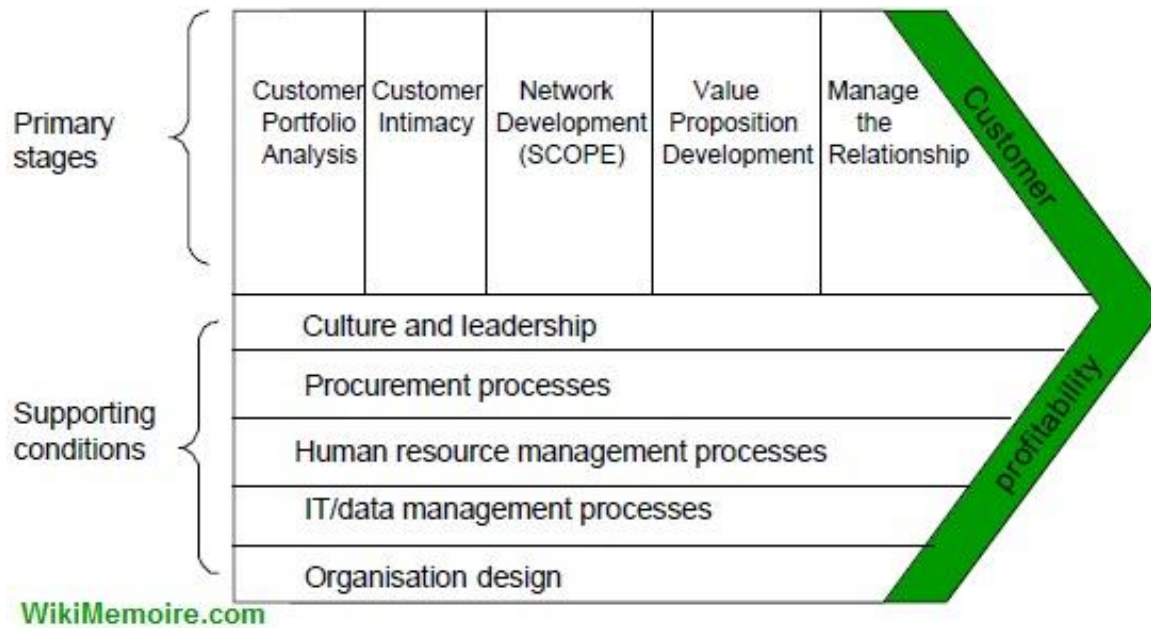


Figure 2.8: The CRM Value Chain (Buttle, 2000)

The main purpose of this model is, according to Buttle (2004), to ensure that the company builds long-term mutually-beneficial relationships with its strategically-significant customers. Thus, some customers are merely expensive to acquire and service.

Buttle has identified four types of strategically significant customer (SSC) such as the high life-time value customer that is a key SSC and the present day of all margins that might be earned in a relationship. He stated that tempting as it may be to believe, not all high volume customers have high LTV. If they demand JIT, customised delivery, or are in other ways costly to serve, their value may be significantly reduced. We know of one company that applied activity-based costing disciplines in order to trace process costs to its customer base [...] as consequence the company re-engineered its manufacturing and logistics processes, and salespeople negotiated price increases

The second group of SSC is according to the above author “benchmarks” that are customers that other ones copy. For instance, a manufacturer of vending machine equipment is prepared to do business with any company because “*they can tell other customers that they are supplying to the world’s biggest vending operation*” (Buttle, 2000).

The third group of SSCs are customers ‘inspirations’. They are the ones that find new applications, “*come up with new product ideas, find ways of improving quality or reducing cost. They may be the most demanding of customers, or frequent complainers, and though their own LTV potential low, they offer other significant sources of value*”.

The fourth one deal with what Buttle (2004) calls “cost magnets” relating to those that absorb a disproportionately high volume of fixed cost, thus enabling other, smaller customers to become profitable

John Stevenson (2007), asserts that the CVC includes four stages:

- The first stage deals with grouping customers in order to determine which of customers are most profitable. The result the companies should seek is their target customer base. They should rate and segment their clients into groups that are most desirable to do business with they meet their criteria for what a desirable customer is. This is called, according to Stevenson (2007) the Customer Portfolio Analysis.
- The second stage deals with the customer intimacy. Having found the segments the firms want to pursue, they need to get to know the ones in that segment very well and better than their competition knows them. Briefly, they want to appear that they know them intimately by, for example, in knowing their birthday, the number of children they have and their respective birthday.
- The third stage relates to Value Proposition Definition. Thus having understood as much as they can about the customers they have chosen to serve, companies are then in a position to create a specific and tailored value proposition for them.

Buttle (2000) previously raised five steps to profitable relationships that are, customer portfolio analysis (CPA), customer intimacy, network development, value proposition development and managing the relationship.

Very briefly, the CPA analyses, according to Buttle (2000), the customer base to identify customers to target with different value propositions. The customer intimacy involves the business in getting how to know the selected customers as segments or individuals and building a customer data-base which is accessible to all those whose decisions or activities impact upon customer attitude and behaviour. Buttle involves the network

development as the third step wherein a strong network of relationships is to be built with employees, suppliers, partners and investors who understand the requirements of the chosen customers.

The fourth stage involves developing, with the network's compliance, propositions which make value jointly to the customer and the company. At this stage so far, the network has to work together to create and deliver the chosen value(s) to selected customers, Great value is "*found more effective and more efficient solutions of customers problems*" (Buttle, 2000). The final step is to manage the customer relationship.

However, the above activities or stages need to be managed. Companies need to manage each customer through their lifecycle. To enable the management of the customer lifecycle and the stages within of portfolio analysis, intimacy, and value proposition development, automated data systems are necessary.

The Payne's Five Forces Model

This is a comprehensive model developed by Adrian Payne' The model identifies five core processes in Customer Relationship Management CRM such as the strategy development process, the value creation process, the multichannel integration process, the performance assessment process and the information management process. They can be grouped into strategic CRM, operational Customer Relationship Management CRM and analytical CRM.



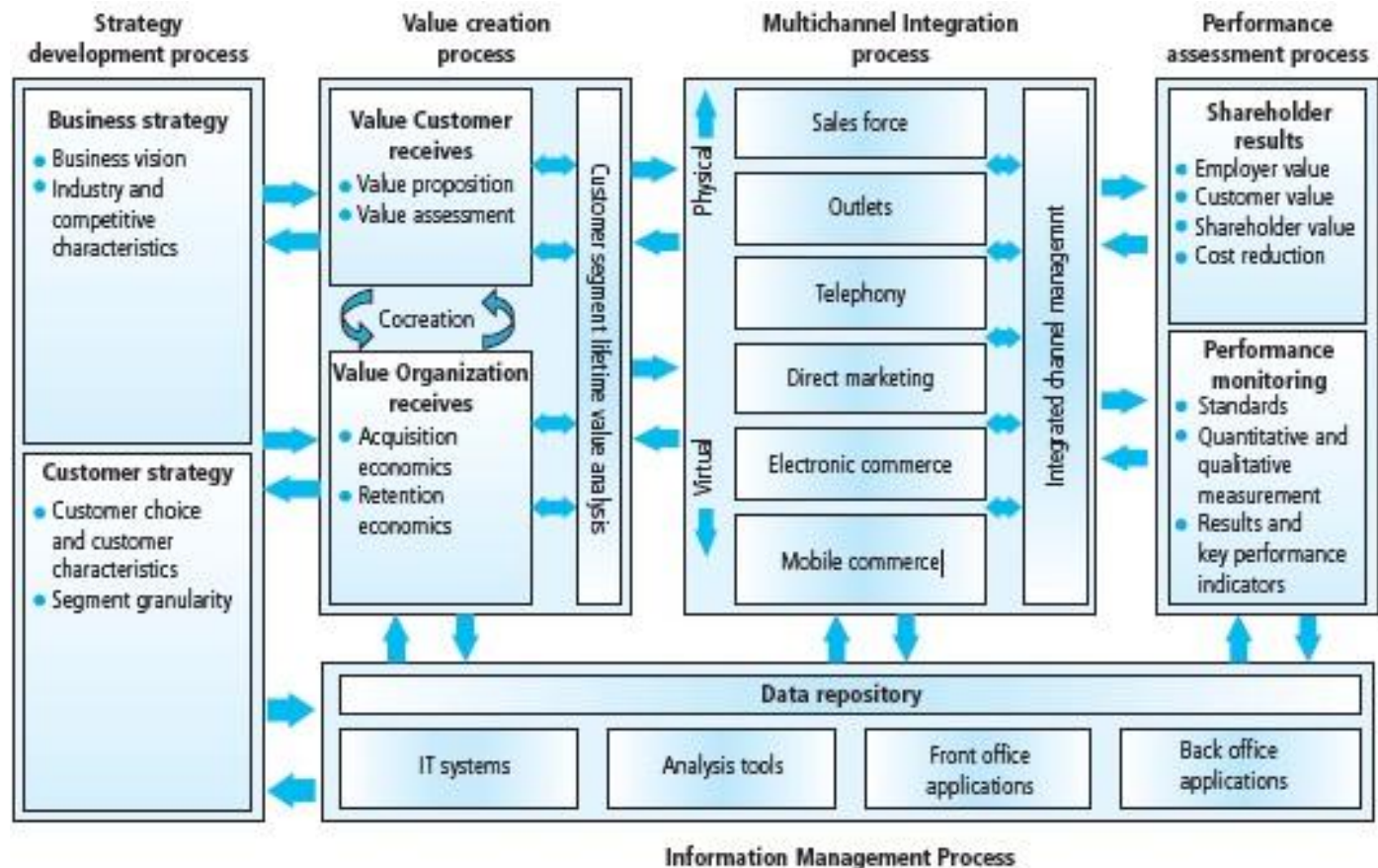


Figure 2.9: The Strategic Model for CRM (Payne, 2006).

Payne (2006) also introduced a strategic framework/model (Figure 2.8) for Customer Relationship Management CRM consisting of five generic processes such as Strategic Development, Value Creation, Multichannel Integration, Information Management, and Performance Assessment.

The Strategy Development process is concerned with integrating the business strategy from the organization angle and the customer strategy as to how firm interact and choose their customers. The Value Creation process with the main purpose of identifying the value the firm can create for the customer and the value the organization can also benefit from. The Multichannel integration consists of all the virtual and physical channels with which the firm plans to interact with. But the main thing here is that, regardless of the channel contact, the aim is to create an experience that is uniform and also common.

The Information Management process consists of many different of data repository IT systems, back and front office applications and analytical tools. It is thus necessary to access the visibility of the system so the need for performance assessment process set in and it is concerned at the strategic monitoring can be used to determine customer satisfaction and standards,

. Various authors have proposed Customer Relationship Management CRM strategy framework. Buttle (2001) provides a Customer Relationship Management CRM value chain that identifies a series of 'primary stages' highlighted above. These are helpful as it considers implementation issues. Sue and Morin (2001) develop a framework for CRM based on initiatives, expected results and contribution. However, this framework is not process-based and, as the authors acknowledge, many initiatives are not explicitly identified in the framework. Winer (2001) outlines a model, which contains: a database of customer activity; analyses of the database; decisions about customers to target; tools for the customer targeting; how to build relationships with the targeted customers; privacy issues' and metrics for measuring the success of the Customer Relationship Management CRM program. All these frameworks provide some useful insights; however Payne and Frow (2005) argue that none appear to adopt an explicit cross-functional process-based conceptualisation; they used an expert panel of executives with the extensive experience within the CRM and IT sectors to identify specific cross-functional processes. Thus the both authors identify five CRM processes including: strategic development; value creation; multi-channel integration; information management; and performance assessment (figure. 2.7).

The Dasai et al /Conceptual Model

The conceptual framework was developed by Dasai et al (2007) in which consideration is driven towards competitive CRM performance from both internal and external perspectives. The dynamic capability for CRM is the key source for competitive CRM performance considering the rapidly changing nature of the business environment today which erodes the values of existing competencies (figure.2.8 below)

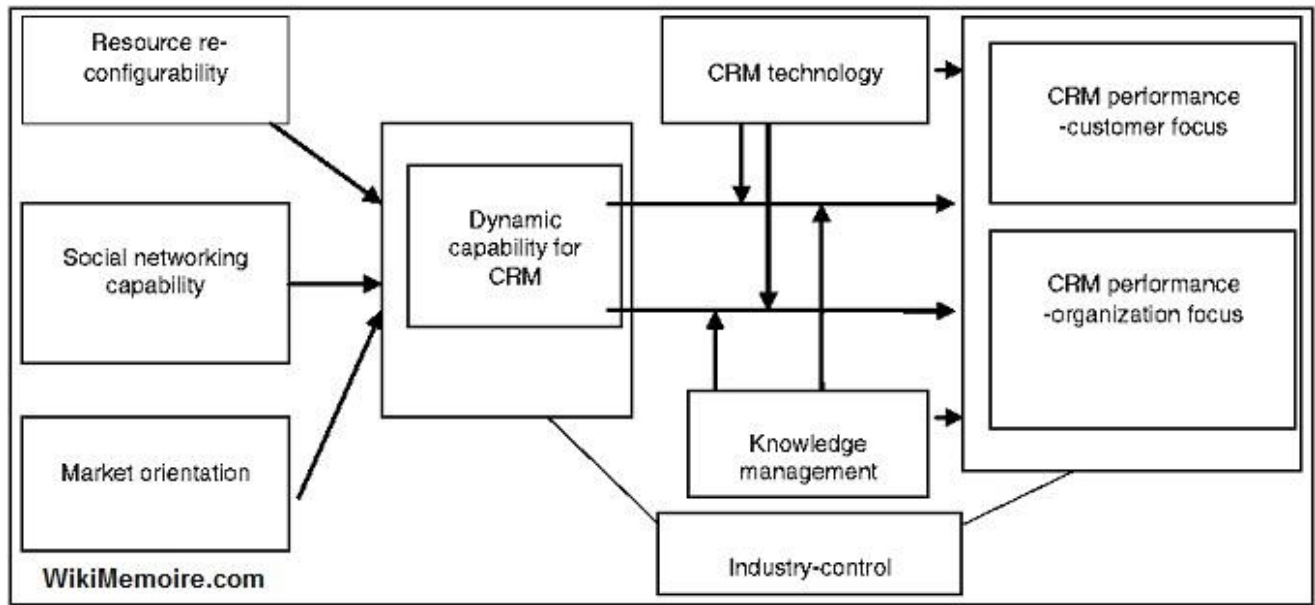


Figure 2.10: Conceptual Model (from Desai et al, 2007)

The figure 2.8 above comprises resources re-configurability, social networking capability and market orientation as the drivers of dynamic capability for CRM. While the IT variables which are the CRM technology and knowledge management are the moderators linking the relationship between dynamic capability for CRM and competitive CRM performance. As such, the direct impact of IT competence variables should be tried and seen on competitive CRM performance.

The Forrester Model

The Forrester CRM model is grouped into four types such as: Strategy; Process, Technology; and People. The model produced results in the findings on over hundreds of companies using CRM as strategically, thorough analysis of over number of vendors' solutions providers and also with discussion with about numerous consultants. For firms willing to kick-start their CRM programs or for those that are finding it tough to get best out of their CRM programs after it has been launched. Also, the performance scorecard (figure 2.9) highlights the criteria used by companies to measure the overall performance using CRM.

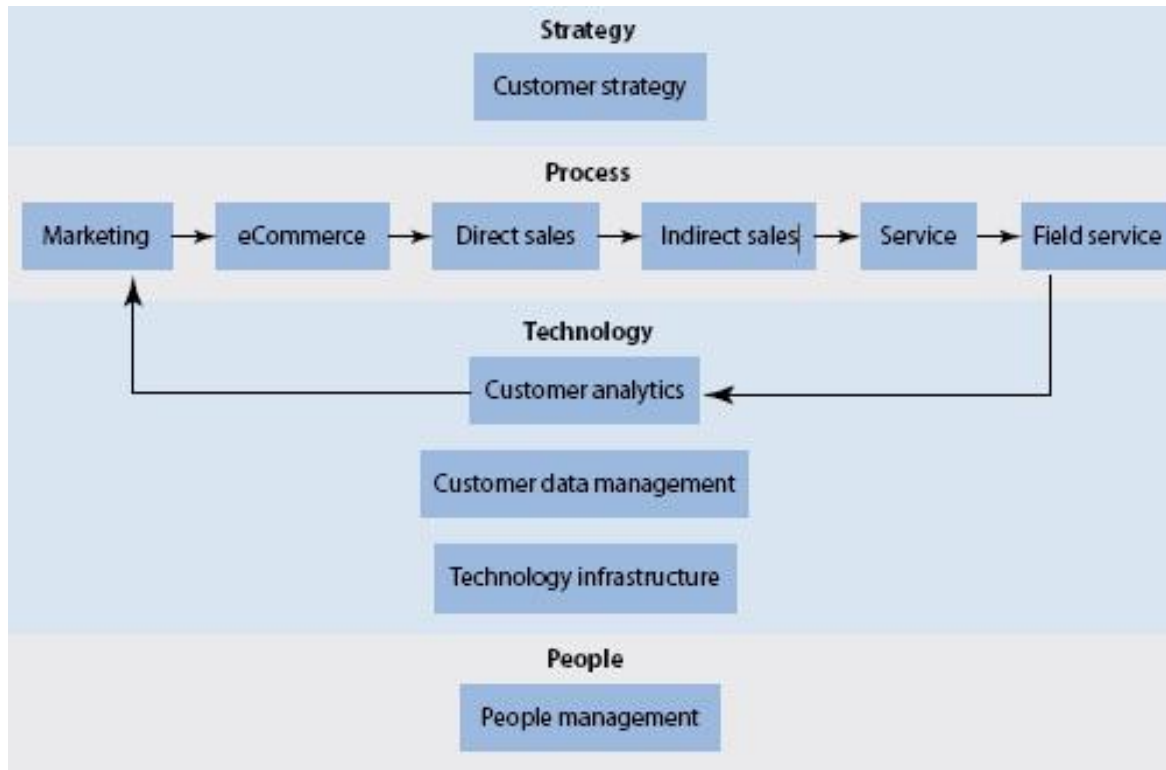


Figure 2.11: Forrester CRM Model (from Forrester Research, 2008)

| Best practices | Company capability (circle appropriate score) | Score |
|--|--|----------------------|
| 1. Build strong executive sponsorship | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 2. Require that business executives lead CRM, with support from IT | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 3. Put in the right governance structure | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 4. Define objectives and processes first, then apply technology | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 5. Follow a realistic pace for rollout | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 6. Define data requirements and data quality management approaches early | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 7. Strive for high user involvement | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 8. Place a high priority on software usability | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 9. Simplify the CRM platform | Low - 1 2 3 4 5 - High | <input type="text"/> |
| 10. Actively manage the vendor relationship | Low - 1 2 3 4 5 - High | <input type="text"/> |
| WikiMemoire.com | Total | <input type="text"/> |

Figure. 2.12: CRM Performance Scorecard (Forrester Research, 2008)

The author notices that the above scorecard looks similar that produced by Gartner Group (IDM, 2002). Yet, few criteria were used. Thus it should be suitable to assert the Forrester's CRM performance scorecard is an improvement of Gartner's one. Table 2.1 presents Gartner performance scorecard.

| Critical Success Factor | Readily available (Score 3) | Achievable with slight difficulty (Score 2) | Achievable with difficulty (Score 1) | Achievable with great difficulty (Score 0) |
|---|-----------------------------|---|--------------------------------------|--|
| Getting a clear understanding of the goals | | | | |
| Gaining top management commitment | | | | |
| Managing change on a wide scale | | | | |
| Funding the project over time | | | | |
| Redefining the business rules and processes | | | | |
| Getting consistent and accurate customer data | | | | |
| Retaining a culture of co-operation and support | | | | |
| >15 Go for it 12-15 Think carefully 8-11 Better not <8 Forget it | | | | |

Table 2.1: Gartner's CRM Performance Scorecard (IDM, 2002)

2.2.7 The Maturity Model

Gartner's CRM Maturity Model is a tool in which the group used in rating enterprises in terms of their capabilities in effectively using CRM. To determine the category in which an enterprise is placed on the model, they are first evaluated in terms of Overall CRM vision and strategy, consistent valued-customer experience, organizational collaboration, processes, information, technology, metrics.

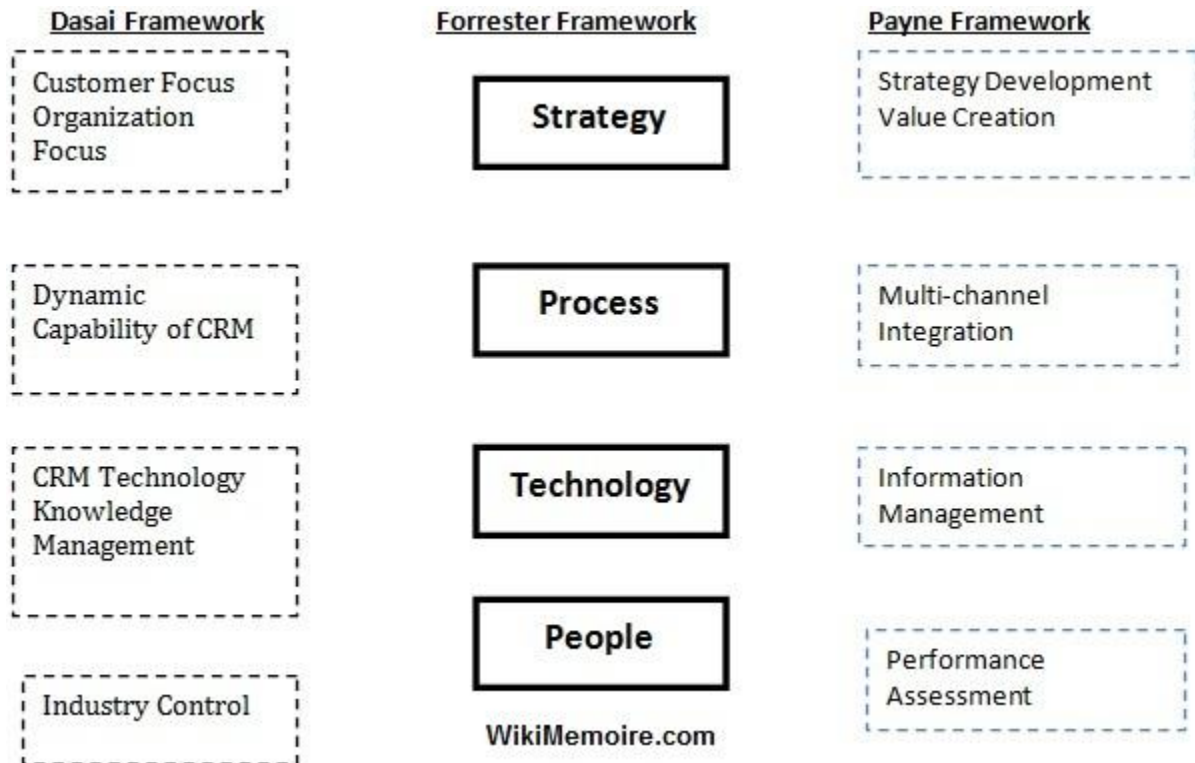
All these elements were what composed of the Garner's performance measurement scorecard which was discoursed earlier on but the difference is that, haven scored your performance based on this elements, the maturity model will then enable the firm to know where they are at the present and where they want to be over a period of time, what the requirement they will need to achieve that status. It is a very useful tool as each enterprise, that aims to satisfying their customer and also to maintain a lead in its

industry, should make use of maybe at every set intervals. Table 2.2 shows what the model is looks like.

| | Score | Description | Definition |
|-----------|-------|-------------|---|
| Excellent | 6 | Maximum | Theoretical highest level of achievement |
| | 5 | Leading | Describes an enterprise that has differentiated itself based on customer-centric capabilities and has simultaneously redefined those capabilities |
| | 4 | Optimizing | Describes an enterprise that has not only developed customer-centric capabilities, but also actively integrates them into its daily operations |
| Improving | 3 | Practicing | Describes an enterprise that has implemented basic customer-centric capabilities; basic CRM capabilities have been implemented |
| | 2 | Developing | Describes an enterprise that has a rudimentary, loosely woven set of customer-centric capabilities in place |
| Poor | 1 | Aware | Describes an enterprise that exhibits few customer-centric capabilities; considering and planning CRM initiatives in this area |
| | 0 | Ground Zero | No action taken on CRM initiatives in this area thus far |

Table 2.2: Gartner’s CRM Maturity Model for Enterprise (Gartner Group, 2001)

From the frameworks analyzed above, it was observed by the researcher that there are similarities which cut across them. Using Forrester Research as a benchmark and placing frameworks by Dasai et al and Payne on both sides of Forrester’s framework, each of the components in the framework were linked together, making it clear that they all similarly have in them all the four elements components of Forrester’s framework.



Dasai Framework

Forrester Framework

Payne Framework

Strategy

Process

Technology

People

Customer Focus

Organization Focus

Dynamic Capability of CRM

CRM Technology

Knowledge Management

Industry Control

Strategy Development

Value Creation

Multi-channel Integration

Information Management

Performance Assessment

Figure 2.13: Different Frameworks Summary (By the Author)

The Figure 2.13 above shows what each of these frameworks contains. Looking at the strategy, this is focused on customer and organization in one side; and strategic development and value creation on the other side. A successful company should understand how the customer base can be turned into an asset through the delivery of a value proposition. According to Close et al (2001), it provides objectives, segments and customers, and it should define how resources will be used interactions.

Respectively the organization, this involves the change of culture, structures and behaviour in order to ensure that the staff, partners and suppliers work together to deliver what is promised. However, the researcher will only consider the Forrester's framework as a basis of our further research.

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UNIT 3

TOTAL QUALITY MANAGEMENT (TQM)

Introduction

There are many approaches in the business domain in order to achieve and exceed the quality expectations of the clients.

For this, most companies integrate all quality-related processes and functions together and control it from a central point.

As the name suggests, Total Quality Management takes everything related to quality into consideration, including the company processes, process outcomes (usually products or services) and employees.

The Origin:

The origin of the TQM goes back to the time of the First World War. During the World War I, there have been a number of quality assurance initiatives taken place due to the large-scale manufacturing required for war efforts.

The military fronts could not afford poor quality products and suffered heavy losses due to the poor quality. Therefore, different stakeholders of the war initiated efforts to enhance the manufacturing quality.

First of all, quality inspectors were introduced to the assembly lines in order to inspect the quality. Products below certain quality standard were sent back for fixing.

Even after World War I ended, the practice of using quality inspectors continued in manufacturing plants. By this time, quality inspectors had more time in their hands to perform their job.

Therefore, they came up with different ideas of assuring the quality. These efforts led to the origin of Statistical Quality Control (SQC). Sampling was used in this method for quality control.

As a result, quality assurance and quality control cost reduced, as inspection of every production item was needed in this approach.

During the post World War II era, Japanese manufacturers produced poor quality products. As a result of this, Japanese government invited Dr. Deming to train Japanese engineers in quality assurance processes.

By 1950, quality control and quality assurance were core components of Japanese manufacturing processes and employees of all levels within the company adopted these quality processes.

By 1970s, the idea of total quality started surfacing. In this approach, all the employees (from CEO to the lowest level) were supposed to take responsibility of implementing quality processes for their respective work areas.

In addition, it was their responsibility to quality control, their own work.

Basic Principles of TQM:

In TQM, the processes and initiatives that produce products or services are thoroughly managed. By this way of managing, process variations are minimized, so the end product or the service will have a predictable quality level.

Following are the key principles used in TQM:

- **Top management:** The upper management is the driving force behind TQM. The upper management bears the responsibility of creating an environment to rollout TQM concepts and practices.
- **Training needs:** When a TQM rollout is due, all the employees of the company need to go through a proper cycle of training. Once the TQM implementation starts, the employees should go through regular trainings and certification process.
- **Customer orientation:** The quality improvements should ultimately target improving the customer satisfaction. For this, the company can conduct surveys and feedback forums for gathering customer satisfaction and feedback information.
- **Involvement of employees:** Pro-activeness of employees is the main contribution from the staff. The TQM environment should make sure that the employees who are proactive are rewarded appropriately.
- **Techniques and tools:** Use of techniques and tools suitable for the company is one of the main factors of TQM.
- **Corporate culture:** The corporate culture should be such that it facilitates the employees with the tools and techniques where the employees can work towards achieving higher quality.
- **Continues improvements:** TQM implementation is not a one time exercise. As long as the company practices TQM, the TQM process should be improved continuously.

The Cost:

Some companies are under the impression that the cost of TQM is higher than the benefits it offers. This might be true for the companies in small scale, trying to do everything that comes under TQM.

According to a number of industrial researches, the total cost of poor quality for a company always exceeds the cost of implementing TQM.

In addition, there is a hidden cost for the companies with poor quality products such as handling customer complaints, re-shipping, and the overall brand name damage.

Conclusion:

Total Quality Management is practiced by many business organizations around the world. It is a proven method for implementing a quality conscious culture across all the vertical and horizontal layers of the company.

Although there are many benefits, one should take the cost into the account when implementing TQM.

For small-scale companies, the cost could be higher than the short and mid term benefits.

TQM in Procurement

Quality is an important part of the supply chain, whether it is quality inspections during the manufacturing process, quality checks before goods arrive at the customer, or checking [quality](#) as raw materials and parts enter the factory. Before any part or raw material is used in a manufacturer of a finished good that will be delivered to a customer, it is the responsibility of the purchasing department to ensure that the materials that arrive are of the correct quality specification.

Quality in the Purchasing Process

When the purchasing department are looking at the procurement of materials from suppliers they will have been given some guidance by the [manufacturing](#) department, research and development, or the quality department. This should include a variety of information about the item to be sourced, such as physical description, dimensional measurements, chemical composition, performance specifications, standards to conform to, or even the brand name of the product.

- Physical Description – the purchasing department must know the physical attributes of the part they are required to source. For example, if the required material must be made of a certain shade of a blue, then the purchasing department must be able to communicate that requirement to the potential suppliers to ensure that the specification can be met.
- Chemical Composition – this is very important for sourced materials that are used in the [chemical](#) process. The quality department should give the purchasing team a detailed list of chemical specifications of the required material. This should include a list of

characteristics and specifications that the materials should conform to, as well as the ranges that the materials must lie within. For example, a sourced chemical may be required to have a pH of between 5.6 and 5.9; otherwise the material would not be suitable for the [manufacturing](#) processes.

- Dimensional Measurements – for a part to be used in the manufacture of a machine the part must conform to certain dimensional specifications. For example, if the manufacture of a finished item required the use of a Pentalobe TS1 screw with a length of 4mm, then the supplier must be able to produce the item in that correct size.
- Performance Specifications – if a part is required to withstand certain forces or perform in a particular manner, the purchasing department must find a supplier that can achieve those specifications. For example, on a household item such as washing machine, the rubber belt that is used must be able to withstand certain forces and not fail within a certain number of revolutions. This quality measurement is key for a business if they are to produce finished goods that are reliable in the eyes of their customers. Therefore it is important for the purchasing department to find suppliers who can provide parts that meet quality specifications.
- Industrial Standards – some parts required in the production of finished goods must conform to certain industry standards. These standards are set by a number of trade or industry groups who try to maintain a certain level of quality. By having an item that conforms to a particular industry standard, the customer will have a level of confidence in the product. There are a number of industry standards that are used, such as Society of Automotive Engineers (SAE), which is a global association of more than 128,000 engineers and related technical experts in the aerospace, automotive and commercial-vehicle industries. The society has hundreds of standards that relate to different technical aspects of manufacturing.
- Brand Name – sometimes the quality department or development team will inform the purchasing department to only source a particular brand name. This may be due to the specific nature of the part made by one company or the level of quality it has over competitors.



Summary

The quality of the parts and raw materials that are used by a company makes a difference to the finished products that are sold to their customers. By ensuring that the purchased parts are of a specific quality as defined by the development, manufacturing, or quality departments, the purchasing department are ensuring that the quality of the finished goods are maintained.

UNIT 4

LEADERSHIP AND SCM

Leading in the Information Age

By DONALD J. BOWERSOX and NICHOLAS J. LAHOWCHIC

The rapidly emerging technology of the Information Age is calling into question many traditional supply chain best practices. In this adaptation from their new book, *Start Pulling Your Chain! Leading Responsive Supply Chain Transformation*, the authors describe a four-stage transformation process for guiding companies as they move from a traditional, anticipatory approach to a response-based, or "pull," business model.

On February 10, 2006, the last Western Union telegram had been sent. The permanent termination of a service that had continuously operated since 1861 was announced using an e-mail. Few noticed or seemed to care. Most in Generations X and Y had never sent or received a telegram.

While recently dining on the deck of a harborside restaurant, the authors and their spouses enjoyed a world-class Lake Michigan sunset. People of all ages gathered to enjoy the sunset because it was spectacular. Many were taking pictures and sharing instant results with their companions. In a matter of minutes, scores of pictures had been taken, shared, and in many cases erased. Only the best of the best pictures were retained. Throughout the picture-taking process, cell phones were being used alternately to complete calls and to take pictures. Of interest was a Detroit Tigers fan using his cell phone to watch, and update for those concerned, the play-by-play telecast of the Tigers-Twins game currently under way in Minnesota. Wireless connectivity (Wi-Fi) was operative, with photos being shared with others in less fortunate locations throughout the globe. At a corner table, a Blackberry or a Sidekick was serving its master by messaging a colleague at some distance away. Because of the serious demeanor of the person involved, the conversation could easily have been a consultation concerning a critical medical procedure under way at a local or distant hospital. A careful look at a semi-

bored teenager in the corner revealed an iPod saving the moment by allowing her to listen to a favorite tune, most likely selected from a digital library containing thousands of songs.

In today's digitally connected world, it's not hard to imagine even more forms of 21st-century technology that could have been actively in use on the restaurant deck. For example, to the best of our knowledge, no one present was participating in a chat room, nor was anyone creating or commenting via a blog. But someone could have done so because wireless service was available. Despite the beautiful sunset, the scene was far from a Kodak moment—in fact, Kodak, a firm currently engaged in a major transformation, most likely didn't manufacture or market any of the products being used on the deck. What we experienced that evening was the reality of a connected, multitasking, digital world simultaneously at rest, at work, and at play. Is there any doubt that the Information Age has arrived and that the 21st century is rapidly becoming increasingly different from the past? Can one deny that we have, in fact, become a highly connected, digital economy?

The 20th-century change experience, for the most part, was one of living out the natural progression of the Industrial Revolution. Most agree that the origins of the Industrial Revolution can be traced to the textile industry in Great Britain in the late 18th century. However, it was more than 70 years before the true forces of industrialization began to change the way we thought, worked, and lived. Most of today's middle-aged and older adults grew up in a 20th-century culture that demanded substantial justification and testing before undertaking change. Technology adoption was gradual, and change was relatively slow. Adopters of the industrial technology progression required that most new inventions prove they would result in social and economic betterment. Technology characteristic of the Industrial Revolution was generally perceived as achieving more and more desirable results (effectiveness) for less and less total effort (efficiency). Across the decades, the Industrial Revolution translated into the highest standard of living ever known to the human race. However, the 20th century is gone!

Having a life experience limited to the past couple of decades of the 20th century, most members of Generation Y are accustomed to continuous and radical change.¹ They were born after cell phones became common and are not surprised by the functional progression of what they consider normal communication. In short, they have never heard of crankoperated phones, party lines, and switchboard operators. Compared to those of their parents, and even more so to those of their grandparents, their change experiences have been mostly radical

instead of gradual. Most change has been positive. All such changes have come at a rapid pace. As a result of positive reinforcement, most of the younger generations embrace change without question. Likewise, they do not require total understanding of the origins of change or what might be the ultimate consequence such change will have on what they do or how they do it. They are confident that mistakes can be redirected into progress. Such is the mind-set of our emerging 21st-century business leaders. A willingness to adopt technology and, if necessary, radically change traditional practice to exploit such technology may well turn out to be our global society's saving grace.

Thomas Friedman's mind-stretching essay *The World Is Flat* captures the dynamic changes that characterize the new global era.² In terms of connectivity, he views the world as having shrunk from small to tiny. He eloquently describes "Globalization 3.0," wherein people, products, and ideas flow freely across borders and new communication technologies and business processes create a new global platform for sharing knowledge and work across time and distance. While totally agreeing with Friedman's description of the magnitude and far-reaching implications of rapidly occurring global change, those of us who are deeply committed to researching, teaching, and managing real-world supply chains know that existing business models and related best practices are inadequate to fully exploit the potential of 21st-century technology. Those who live in the reality of today's supply chain know that the dream of products flowing freely throughout the globe is in stark contrast to what really happens at ports, in and between warehouses, and along the highways, railways, and waterways of the world.

Friedman includes "supply-chaining" as one of the 10 key "flatteners" facilitating the convergence of political, technological, and process-oriented forces to create a new order of global affairs. Using Wal-Mart as an example, one gets the notion that successful change is more or less achieved by the application of power and determination. The Wal-Mart business model has clearly revolutionized our understanding of how logistics can be deployed to leverage corporate success. The reality is, however, that the purpose of day-to-day supply chain work has not changed much since the beginning of civilization. How the supply chain does its daily work changed significantly as a result of the Industrial Revolution and is currently on the verge of once again changing dramatically as we navigate the Information Age. As elaborated in the forthcoming pages, much is changing in terms of both currently perceived supply chain best practices and associated leadership challenges.

A demonstration often used in elementary schools serves to illustrate the fundamental information-technology-driven change occurring in supply chain management. Many teachers use a string to demonstrate ease and resistance when applying energy to movement. While it is very easy to pull a string along a surface, it is impossible to push a string even an inch without it buckling or bending. The point of the demonstration is to illustrate that pulling the string overcomes friction, resulting in ease of movement. While in reality very few of us would try to push a string, pushing the supply chain is exactly what we have been doing since the beginning of civilization.

Traditional supply chains have been designed to operate in an anticipatory, or "push," mode. The prevailing approach to distribution is a time-consuming, forecast-driven, volume-oriented, function-centric consolidation process designed to push products out to market destinations in anticipation of future demand. The all-too-frequent result of this anticipatory push process is far too much of the wrong inventory being pushed to the wrong markets. This misalignment of inventory often results in firms using incentives to entice consumers to buy products they have available to sell rather than providing the exact product the customers desire to purchase. A prime example is the widespread use of consumer purchase incentives to sell automobiles that were manufactured to forecast—or what might be better called a "best guess"—of customers' future purchase desires. This traditional push practice, true of both domestic and foreign suppliers, has started to change to a responsive, or inventory "pull," model across most industries.

A combination of customer connectivity and more responsive supply chain operations will increasingly enable demand sensing to pull products to points of desired purchase. In situations where products are built to customer specification, the entire order-to-delivery cycle can be dramatically compressed to allow fast and precise customer accommodation. The information technology enabling rapid demand responsiveness and customer connectivity is becoming more and more available and economical. The time has arrived to stop pushing and start pulling your supply chain!

At the 2005 Aspen Institute Roundtable on Information Technology, 25 thought leaders discussed the broad implications of "push" versus "pull" economies. The following definitions capture the fundamental differences between them.

A push economyâ€”the kind of economy that was responsible for mass production in the 20th centuryâ€”is based on anticipating consumer demand and then making sure that needed resources are brought together at the right place, at the right time, for the right people. A company forecasts demand, specifies in advance the necessary inputs, regiments production procedures, and then pushes the final product into the marketplace and the culture, using standardized distribution channels and marketing.

By contrast, a pull economyâ€”the kind of economy that appears to be materializing in online environmentsâ€”is based on open, flexible production platforms that use networking technologies to orchestrate a broad range of resources. Instead of producing standardized products for mass markets, companies use pull techniques to assemble products in customized ways to serve local or specialized needs, usually in a rapid or on-the-fly process.

In the pull model, companies recognize that trying to anticipate demand is a losing proposition and that, in any case, customers have far more market power than ever before. Small niches of consumer demand, long dismissed or patronized by sellers, are a growing market force unto themselves.

They can increasingly induce sellers to develop specialized products and services to serve narrow and time-specific market demands.³

The 21st-century managerial challenge is one of assessing the far-reaching implications of this basic economic shift for supply chain structure and strategy.

As the power of 21st-century information technology is applied to supply chain operations, most twentieth-century best practices will dramatically change. The technology is here today to support such massive change. Business managers capable of innovative change are moving into positions of senior leadership. What is lacking is an integrative framework to leverage and transform how 21st-century technology can be applied to improving essential supply chain work. The authors and many others believe that such a framework exists in the responsive supply chain business model.

Emerging business leaders must develop new mental models and visions of their future business operations in order to avoid marginalizing the potential of rapidly emerging

technology. They need to develop a sustainable curiosity about how to best exploit the Information Age. For better or worse, the 21st century will not be business as usual.

Entering the 21st century, we face a new, different, and more pervasive wave of change. This change force represents the first shockwaves of the Information Age. Many additional shocks are sure to follow. Even at this early date, the Information Age is characterized by a growing presence of disruptive technology (DT). DT is defined as a new innovation or invention that appears to have great potential but does not fit well into existing processes, procedures, or what is traditionally perceived as best practice. Harnessing the full advantages of DT typically requires significant and innovative behavioral change—something humans are not good at. To fully exploit DT, leaders often have to develop a totally new approach for solving problems—something leaders traditionally have not been good at. In other situations, DT can solve or modify an existing problem, thereby eliminating the need for continued performance of a deeply institutionalized best practice.

DT is not new or exclusive to the Information Age. DT was at the leading edge of the Industrial Revolution. Inventions such as wireless messaging, the light bulb, the cotton gin, the telephone, steam, internal combustion and jet engines, transistors, nuclear energy, silicon chips, and miniaturization were some of the major disruptions associated with the Industrial Age. This earlier disruptive experience reinforces the current point. Harvesting the full benefit of DT requires significant modification of traditional practices in terms of both behavior and measurement—maybe some currently perceived best practices need to be eliminated. For most future leaders, this means that fully exploiting DT will require that the "plug-and-play" technology mentality that emerged during the late 20th century be abandoned.

While much operational development will be needed to bring current supply chain performance to the full potential offered by 21st-century technology, three facts seem indisputable.

First, customers are becoming more connected to businesses from which they choose to purchase merchandise and services. Along the supply chain, businesses themselves are also being linked by connective information technology. The entire supply chain is simply more connected.

Second, the technology necessary to reinvent and dramatically improve supply chain operational processes is available today. Unlike generations past, wherein technology availability was a future promise, the essentials for achieving both customer and supply chain connectivity are here today and are affordable.

Third, the systems, functions, processes, imagination, and regulatory framework of the 20th century do not offer an adequate blueprint for leading in the rapidly emerging digital global economy. Leadership in a connected and networked world requires a new framework offering significant modification in what is considered today's best practice. To fully exploit available and emerging technology requires that today's prevailing operational structure and strategy be reinvented. Such reinvention and associated transformation consist of far more intensive change than traditional business process reengineering. What we foresee developing we call the "responsive supply chain business model."

Take, for example, how "time shrinkage" is currently affecting best practices in new product design and development across industries. In the health care industry, new medical devices now move from idea to physical prototype in hours rather than weeks. Technology has enabled the replacement of traditional two-dimensional drawings with three-dimensional digital CAD/CAM specifications and prototypes, thereby eliminating previously required teams of engineers, construction molds, and elaborate physical prototypes. Because of the resulting speed and ease, new product conceptualization and design now happen in days versus the months required in the past.

The revolution occurring in digital imaging technology is transforming the way the fashion industry performs its commercialization process and related marketing message creation. Using calibrated digital imaging and working at remote locations throughout the globe, fashion designers can validate color and finish specifications to standardize fabric and package design. The result is a dramatic reduction in production time from as many as two months to as little as a few days.

In the opening paragraphs of this chapter, an example of technology deployment taking place during a northern Michigan sunset was used to illustrate a few of the many ways that digital technology is connecting and changing our daily living. Such technology, commonplace to the Y and Now generations, is also turning companies such as Kodak and Fuji, as well as the

commercial users of their products and services, on their heads! For example, in high-fashion consumer products and in publishing industries, the process of rendering "camera-ready" copy is being totally reengineered.

What is developing is that virtually the entire method of making and using photos in product design is being replaced with a new, digitally based technology that is cheaper, faster, and, most important, better. Using digital cameras, photographers can repeatedly shoot photos and rapidly finalize a customized image. Additionally, digital photos can be quickly and easily "morphed" to further enhance their viewing image for presentation to targeted consumers. This digital photo production and associated electronic catalog management have revolutionized the speed, variety, and degree of customization available to target unique buyer segments. Catalogs and websites are being tailored to specific and relatively small consumer-market segments. This connectivity is allowing companies to turn small but profitable market segments that previously had been neglected into profitable customers. Such technology-driven practices are becoming commonplace among companies such as Victoria's Secret, Ralph Lauren, Target, JC Penney, and Amazon.com. These examples of customization can be achieved in real time as consumers use technology to interact with a company.

Thus, wherever we look, examples of changing ways of working, buying, and consuming abound. The early signs of the evolution from push to pull are everywhere. Firms and associated best practices are being reinvented to take advantage of this global transformation. Adapting the ways and means of the responsive supply chain business model is but one part of the digital transformation being driven by 21st-century information technology. However, changing the ways and means of how supply chains operate is a vast undertaking.

To fully exploit the benefits of 21st-century information technology in the supply chain space, a major structural and philosophical shift is required in how one conducts business operations. The traditional command-and-control structure of individual organizations, as well as the sequential processes characteristic of existing business transactions, will be hard to modify or change sufficiently to accommodate the requirements of a responsive business model. Some observers have long predicted that radical organizational and operational change will be required to exploit emerging technology and warned that such massive change may not be achievable. On the basis of examples from the Industrial Revolution, others believe that the

necessary radical change will be accomplished only if existing organizational structures and institutionalized best practices have been completely abolished or have disintegrated.⁴

While many executives may not be fully sold on the theories of destructive change, achieving 21st-century responsive supply chain leadership is not viewed as an easy goal to accomplish. New mind-sets, methods, and measures must be framed to achieve goals and avoid unintended consequences.

Although significant change will be required to exploit emerging information technology, we believe that the seeds of new and far-reaching best practices to meet and exploit future challenges can be found among today's leading-edge firms. Building on research and practice, we develop and present a framework to help guide the required change: the responsive supply chain business model. This model offers one perspective concerning how the initial waves of DT associated with the Information Age can, say, between 2007 and 2025, be absorbed and accommodated to radically affect and improve global business performance. A composite of research, experience, and speculation is used to develop a transitional model for competing in the global digital economy.

Of course, business operations represent only one facet of society that will be disrupted by rapidly emerging digital technology. Equal, or more dramatic, changes will simultaneously affect how we practice medicine, how we educate, and how we govern, as well as every other facet of how we live our daily lives. However, on the basis of the initial impact of Information Age technology (1995–2007), it appears that the business community may be one of the most disrupted of today's institutions. The significant change required in processes as fundamental as basic business operations will serve as an ongoing example of just how out-of-tune some existing best practices are when confronted by the opportunities of a global digital economy.

To adequately shape a process as complex as global supply chain operations requires an in-depth understanding of what is changing. For example, most products are, and will remain, physical and perishable entities subject to damage, pilferage, and other forms of destruction. While the content and images of information-based products, such as documents, films, and videos, can be transmitted around the globe at lightning speed, most products need to be physically transported from origin to destination. At least for the foreseeable future, such

transport will be performed using 20th-century methods of transportation, namely, trucks, trains, planes, ships, and pipelines.

Such transport takes time and costs a great deal of money. A reasonable estimate is that the global logistics expenditure for 2008 will exceed \$8 trillion. Given the proliferation of today's practices, global transportation cost alone is projected at more than \$5 trillion.⁵ To support this costly and time-intensive logistical process will require maintaining approximately \$4 trillion of inventory, at an annual cost of approximately \$1 trillion in interest, storage, handling, insurance, obsolescence, damage, and theft. While these are projected costs, they, or similar expenditures, soon will become real costs of doing business. These costs can be favorably affected and reduced—but not totally eliminated.

Adding to the complexity of contemporary supply chains is the growing amount of counterfeiting taking place in global commerce. The World Customs Organization has estimated counterfeiting to involve in excess of \$500 billion of fake goods. Taking positive steps to mitigate the growth of counterfeiting is a major 21st-century supply chain challenge.

Thus, the debate is framed: How can a generation of new business leaders facing the challenges and opportunities of the Information Age reinvent operational best practice to exploit the full potential of a responsive supply chain business model?

Physical products will still need to be moved from origins to final destinations in a secure, damage-free, and timely manner. Much of the work of supply chain management may be outsourced throughout the globe, but it will not go away. In fact, the more global the operational reach of a business, the greater the degree of supply chain reliance and complexity. It is also logical to conclude that physical movement constraints and elapse time required to transport products, components, and materials will continue to be operational impediments or barriers.

In order to take advantage of emerging information technology and capitalize on what in fact is happening, business leaders must face the reality that most of their firms as well as their existing supply chain processes are, to a significant degree, operationally obsolete. In their early attempts to adopt digital technology, many leaders failed to fully understand the extent of operational change that was necessary. They felt that integrated software would facilitate the

necessary work. In most cases, it did not. The managerial challenge, similar to that faced during the Industrial Revolution, is to reinvent existing business operations. Operational practices and rules need to be reinvented to exploit timely and accurate information. The old business model and its associated value proposition are increasingly inadequate to drive leading-edge performance while confronting the challenges and opportunities of the Information Age. All of the required change must be conceptualized and financially supported while the firms involved in transition continue to maintain profitable operations. Business leaders cannot be excused from the need to simultaneously achieve enterprise financial and operational goals while leading a transformation.

While firms that manufacture and sell products face a fundamental transformation challenge in the 21st century, those that provide essential services face the same reality and related challenges. At the 2007 Longitudes conference presented by UPS and Harvard Business School Publishing, Michael L. Eskew, recently retired chairman and CEO of UPS, positioned the overall transformation challenge from the perspective of all global companies and their service providers:

Consumer pull requires one-to-one solutions and supply chains that can deliver them. The world is no longer driven by producers pushing products through their supply chain. Increasingly, power is in the hands of consumers who now pull products through the system. They pull what they want, when they want it, from whomever they choose anywhere in the world. And consumers want and expect a personal, relevant, individualized experience. This is a big shift that will only intensify.

And then Eskew went on to elaborate his vision of what this basic shift to a pull economy means for UPS and its need to transform.

UPS is poised to deliver this kind of personal experience by being "one-to-one" with each customer. For UPS, one-to-one means serving each customer as if they are UPS's only customer and operating as if each transaction is the only transaction and each package is the only package. UPS is focused on this "one-to-one" vision and on a strategy that seeks to help customers synchronize their global supply chains. It is UPS's aspirational view of the supply chain done right.⁶

Clearly, all companies and their service partners are participants in the essential transformation.

Transformation: Getting it and keeping it right

The process of leading a business transformation to operationally exploit information technology and benefit from its anticipated disruption is our subject. In the 21st century, firms will continue to seek strategies that combine the benefits of specialization and integration. However, the basic value-creation model in a global economy has changed.

Some readers might quickly conclude that neither Web-based technology nor supply chain represents a new topic to 21st-century senior leadership. Both have significantly affected our business landscape for nearly a decade. What is emerging is a more comprehensive understanding of the appropriate leadership that is necessary to initiate and sustain a complex organizational transformation. Such a transformation constitutes a fundamental reinvention of the basic way an organization operates. The goal is to maximize the favorable impact of Web-based technology. Initially, many senior executives felt that the challenge could be met by purchasing integrated enterprise resource planning (ERP) software. While such plug-and-play practices worked in the past, harnessing the scope and power of Web-based technology proved to be more demanding. Most limited transformations failed to meet expectations. To put it bluntly, most simply failed. The reality is that most 20th-century organizations need to be reinvented in order to take advantage of 21st-century Web-based technology.

Lessons concerning the resources and human capabilities required for success have been learned from the failures and partial successes of early transformations. We think the development and use of a four-stage leadership-transformation process or map that proceeds from awareness, to ratcheting, to catapulting, to sustainability provides some of the enlightenment and possible direction of actions required to succeed in this important endeavor.

The initial stage of transformation requires awareness, understanding, and commitment among all employees concerning the fundamental need to rethink and (to the extent required) modify a firm's basic business model. All employees need to fully understand the compelling reasons why the business must adopt a new structure, strategy, and behavior if it is to fully exploit increasingly available information technology. Most people are uncomfortable with

comprehensive change. From top to bottom in a traditional brick-and-mortar firm, it is critical that employees understand that in most cases there is no choice: Change is essential for survival. Failure to achieve widespread awareness of the fundamental need for change as well as to create a willingness to embrace such change is one of the leading reasons business transformations fail.

Given awareness, the second stage of transformation involves a comprehensive commitment to achieving the highest level of supply chain performance. We call this second stage of transformation "ratcheting." The term ratcheting was selected to emphasize that successful transformation requires a renewed and elevated commitment to improving performance relative to three traditional operational imperatives; namely, consumer connectivity, operational excellence, and integrative management.

These imperatives combine to drive a market-sensitive perspective concerning the fundamental importance of elevating and maintaining industry-leading performance, day-in and day-out. Such an exacting standard of performance is the operational prerequisite for winning in the global economy. A firm that is capable of successfully ratcheting is positioned to catapult its overall performance. The challenge is to not settle for marginal improvement. The organization must catapult beyond marginal change if it is to implement a responsive business model.

By building on ratcheting's momentum, a leading business is positioned to raise the prevailing industry performance standard. In the third stage of transformation, "catapulted" firms are viewed as supply chain orchestration leaders. They are select organizations whose commitment to customer responsiveness establishes the operational standard of excellence for their industries. Catapulting is all about exploiting operational competency by means of achieving three additional imperatives. These additional imperatives are real-time responsiveness, network leveraging, and collaboration. It is during the catapulting phase that the potential for global leadership evolves. Firms that reach the lofty distinction of being "leading edge" in the Information Age will set new standards concerning what constitutes world-class performance.

Once response-based, world-class performance has been achieved, maintaining that level of performance requires increased vigilance concerning what firms do and how they do it. This final stage of transformation is called "sustainability." Being sustainable is a long term

proposition that requires continued and renewed leadership, improved measurement and motivation, and a commitment to meeting future challenges.

The challenges of sustainability are not the same as those confronted in the first three stages of transformation. Whereas the spirit of leading essential change was the driving force during the initial three stages, sustainability involves day-in and day-out commitment to maintaining and renewing all six transformational imperatives. Our thesis is that the emerging leadership model must become increasingly inclusive and involve all levels of employees. Most of the work that is essential for achieving supply chain excellence occurs outside the vision of supervision. Flat and globally extended organizations need leadership at all levels of engagement. In a similar vein, driving crossorganizational performance creates the need for new performance metrics. The discussion about futuristic perspectives must center on how the explosive impact of the Information Age is likely to continue to change business best practices much faster than was experienced during the Industrial Revolution.

Within the new information-driven frontier, leadership needs to fully commit to the realization that business operations must continue to achieve day-to-day operational goals. At the same time, senior leadership must be equally committed to developing a plan for initiating responsive supply chain transformation.

Endnotes:

1. Since World War II, it has become fashionable to label generations by their dominant characteristics. Those born after 1946 are referred to as "baby boomers." Their children, known as Generation X, are now approaching their forties. The next generation, Generation Y, is the technology-savvy generation that taught its parents how to use computers. Finally, the most recent generation is known as the Now Generation because of its expectations of instant gratification arising from having been born in the Information Age.
2. Thomas L. Friedman, *The World Is Flat* (New York: Farrar, Straus and Giroux, 2006).
3. David Bollier Rapporteur, "When Push Comes to Pull: The New Economy and Culture of Networking Technology," a report of the Fourteenth Annual Aspen Institute Roundtable on Information Technology. The Aspen Institute (2006): p. 4.

4. Christopher Meyer and David Power, "Enterprise Disintegration: The Storm before the Calm." *Commentary*, (Lexington, Mass.: Temple, Barker & Sloane, 1989).

5. Alexandre M. Rodrigues, Donald J. Bowersox, and Roger J. Calantone, "Estimation of Global Logistics Expenditures: Current Update." *The Journal of Business Logistics* 26, no. 2 (2005): pp. 1â€“16.

6. "Longitudes 07: Competitiveness and the Global Supply Chain," June 20â€“21, 2007, Toronto, Ontario (UPS and Harvard Business School Publishing, 2007): p. 5.

Editor's Note: *Start Pulling Your Chain! Leading Responsive Supply Chain Transformation* is available from the Council of Supply Chain Management Professionals (cscmp.org) for US \$44.95 for CSCMP members and US \$49.95 for non-members.

APPENDIX 1

A Supply Chain Case Study – Socks Manufacturing

 [Niraj Goyal](#) September 2, 2013

A socks manufacturing company in India turned to TQM to improve its supply chain. In Part One, the case study eliminates a significant cost for the company – delivery delays. [Part Two](#) of the case study looks at the broadening of the application of process improvement beyond deliveries.

A fledgling socks manufacturing company in India was working to supply export markets in Europe and U.S. The company was receiving a lot of customer complaints, however, due to delivery problems. The company decided to use [total quality management \(TQM\)](#) and just-in-time (JIT) manufacturing principles to help resolve delivery delays. Their story will be told in two parts:

1. How TQM helped resolve customer complaints
2. How the company was bitten by the “quality bug” and used TQM to increase operational efficiencies beyond their delivery issues

The Project Begins

A two-day program introduced company management (including the general manager of sales and the heads of operations, manufacturing, planning and IT) to the basic principles of TQM – customer delight, [JIT](#), total quality control and total employee involvement.

Through brainstorming and prioritizing exercises, the management team determined that the critical-to-quality attribute for its customers was on-time delivery. However, the company was struggling to meet delivery schedules.

A cross-functional group was formed to resolve this problem. The group scheduled fortnightly meetings to ensure that a plan was created and followed.

The company's improvement story follows the seven steps of TQM:

1. Define the problem
2. Analyze why ([find the root causes](#))
3. Brainstorm countermeasures
4. Test ideas
5. Implement in regular production, modify ideas
6. Standardize results
7. Prepare quality improvement story

Step 1: Define the Problem

When asked to identify problems associated with the delays, member of the improvement team said they ran the gamut from lost orders to additional costs (from shipping delayed orders by faster and more expensive means). These conversations revealed that there were no agreed-upon metrics or ways to determine what constituted a delay and how to quantify those delays.

The team agreed that to monitor improvement in the process they would measure the additional costs incurred due to the delays. If those costs went down, it would indicate that delays in deliveries had been reduced. An initial analysis of data revealed this cost to be 3 percent of sales. The group agreed to try to reduce it by 50 percent – to 1.5 percent of sales.

Step 2: Analyse Why (Find the Root Causes)

Brainstorming for possible causes of delivery delays produced the list shown in Table 1.

| Possible Causes | Category of Cause |
|-------------------------------------|-------------------|
| Lack of professionalism | General |
| Improper information flow | System |
| Contingencies not built in | Planning |
| Improper goal setting | Planning |
| Time wasted in paperwork | System |
| Manpower requirement incorrect | Planning |
| Preventive maintenance irregular | Planning |
| Data formats not usable by all | System |
| Documentation system not followed | System |
| Orders beyond plant capacity | Planning |
| Raw material ordering unsystematic | Planning |
| Individual responsibilities unclear | General |

Categorizing the possible causes revealed that most of the causes resulted from an inadequate planning system. The next step was to examine the planning system used in the supply chain and determine its relationship to delivery delays.

Members of the improvement team role-played a typical sales scenario to further reveal the root causes of the delivery **delays**. Below are listed the members' actual roles and the roles they played for the exercise:

| Table 2: Team Member Roles | |
|-----------------------------------|------------------------------|
| Actual Position in Company | Role for Exercise |
| General manager of sales | Production manager (1) |
| Production manager | General manager of sales (2) |
| Planning manager | Planning manager (3) |

In the role-play scenario, the general manager of sales (2) calls from a customer meeting in Europe and requests an order of 50,000 socks for a customer. "Delivery is required in 45 days. Can we commit? I need to go back with a yes or no in 15 minutes."

The production manager (1) and planning manager (3) huddle together and consider the question. Is there enough material? Are the machines available? Do we have manpower and uncommitted capacity? The discussion between the two is not simple – no clear planning template exists upon which to base an answer. Fifteen minutes later the managers continue to argue, but need to answer the sales general manager. They respond, "Take the order, we will manage!"

Essentially the production and planning managers advised accepting an order without having any idea if they could full the customer's delivery requirement. This role-play exercise highlighted the dysfunction of the planning process.

Step 3: Generate Countermeasure Ideas

The nuts and bolts of an effective planning system for the socks manufacturing company are:

Knowledge:

- Manufacturing capacity
- Capacity availability when required to meet delivery (when making commitment to supply)
- Resources needed to meet commitment – materials, manpower and machines

Selling: To capacity

Operations: **On-time delivery**

At one of their fortnightly meetings, the improvement team planned the next month's operations – systematically. A planning system evolved from this two-day meeting as described below:

1. *Manufacturing capacity.* This topic was hotly debated, as sock designs, length of run, manpower availability, new design development and more all affected that measurement. Opinions differed even so far as the machine speeds that needed to be considered. After a lengthy discussion a consensus was reached for calculating capacity for the mix and type of socks usually processed.

2. *Capacity availability.* Before an order could be booked, the company had to be able to verify capacity. As demonstrated in the role-play exercise, such answers often required protracted debates with no clear metrics to use to make appropriate decisions. The team developed a machine-load planning template that maps the machines and their capacities net of changeovers, maintenance allowances and efficiencies, and would be used to track the daily utilization of the machines.

3. *Deliveries required.* A continuing challenge was that the scheduled orders were not known among critical personnel, even for the current month, let alone planned in detail. To address this, the machine-load planning template would also be used to document orders and indicate which machine is booked for what dates. It will be updated daily with new orders and the previous day's deliveries.

Sales team members were asked to document orders in three categories:

1. Confirmed orders with firm delivery dates
2. Orders being negotiated with likely delivery dates
3. **Possible orders in the future**

It was agreed that the last two categories were not commitments, but would be built into the planning template to aid in delivery scheduling and material planning. As orders moved from possible to confirmed, the required capacity would be blocked on the planning sheet and teams would be ready to take action.

The sales team was asked to update the order book on a dynamic basis – or once a week if no new orders were booked.

When asked to commit to a new order by a specific date, the team could easily map production for the new order based on the existing bookings. They could now commit to new orders with confidence when delivery was feasible. If the required schedule was not feasible they could offer alternative dates or suggest breaking an order into parts in order to meet a customer's needs.

4. *Capacity planning.* In conjunction with the order book updating, capacity planning would also be updated dynamically (again, no less than one time per week).

Commitments for deliveries would be made by booking available capacity when a new order was confirmed by filling up **machine capacity** beyond already committed dates. Significant delays in production for whatever reasons would need future capacities to be remapped to the new situation. Thus, a dynamic planning system evolved.

5. *Management coordination.* To keep on track with the new system, the improvement team scheduled a recurring monthly meeting to plan for the next four to six weeks of production and deliveries.

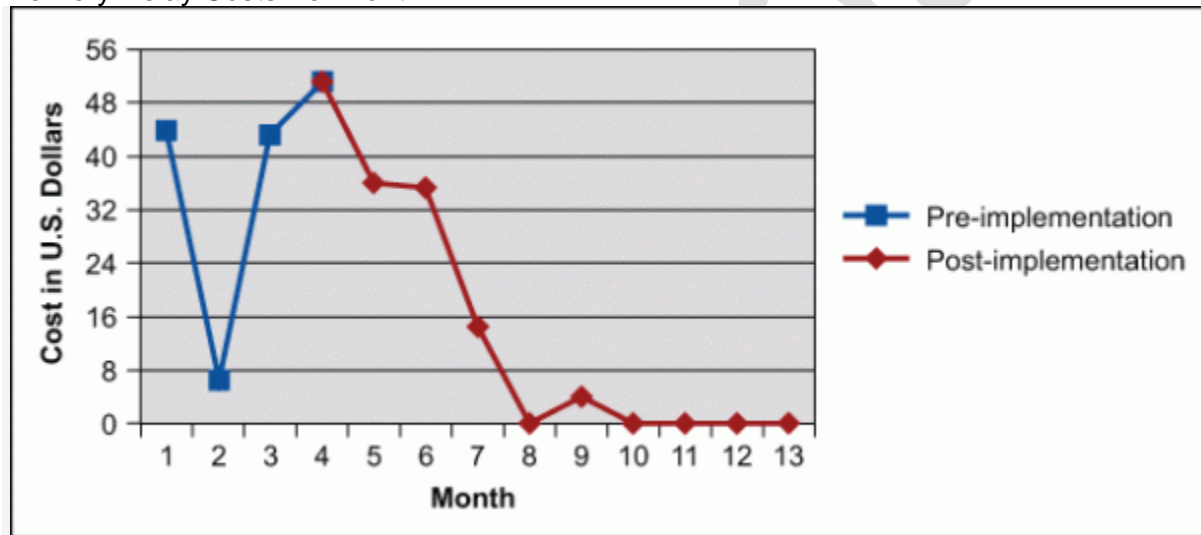
Step 4: Test the Ideas

This system was introduced and reviewed fortnightly in the TQM team meetings.

Step 5: Check the Results

The change between the no-system process and system process is shown in Figure 1. The more months the dynamic planning system was in process the more significant the cost savings to the company.

Delivery Delay Costs Per Month



After only five months of the countermeasures being implemented, the costs due to delays were eliminated.

Step 6: Standardize Results

Months 11 to 13, the months following the initial drop to zero delay costs, repeated that success. The system was institutionalized, and further automated by integrating with the company's internal computer system.

Step 7: Prepare Quality Improvement Story

The successful elimination of delivery costs was present to the company's senior management. This project was such a success that management wanted to address other waste within its factory.

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