"In modern business, the vital role of Management is to come out of the office and boardroom to the post sale or delivery. If those of us who run companies have not got our customers' insight, and within earshot all of the time, we shall be passed over."

-Sir Colin Marshall, Chairman, British Airways

"It is imperative that the IT company knows exactly who the customer is and what his specific needs are. In this environment, every company needs to redefine its vision, re-orient and innovate, in order to succeed."

-CA world
CHAPTER 2

LITERATURE SURVEY

Survey of literature on the maintenance service function with reference, mainly, to service management, service quality, technology in services, technology in spares management and knowledge management in services has given rise to the findings which are presented in this chapter.

For the sake of clarity, the review of literature has been structured under the following heads:

2.1 Evolution of services marketing as an academic field
2.2 Service management
2.3 Service quality
2.4 Technology in services
2.5 Customer relationship management (CRM)
2.6 Technology and inventory management
2.7 Knowledge management in services
2.1 Evolution of services marketing as an academic field:

Leonard L. Berry and A. Parasuraman, (1993) dealt with the evolution of services marketing as an academic field of interest. According to them, services marketing is still a relatively new field of study. The early years of marketing as an academic discipline (in the late nineteenth and early twentieth centuries) initially focused on selling agricultural products and then expanded it to include the selling of manufactured products. The accepted wisdom was that marketing involved only physical goods and services such as accounting, banking, insurance and transportation. These were seen by academics merely as aids to distribution and selling, not as products to be marketed in their own right. Most marketing scholars ignored the shift to a service dominated economy. Berry and Parasuraman note that for many years it was seen as risky to a younger academic’s career to undertake research in an area which older professors saw as unimportant.

Brown, Fisk and Bitner (1993) divided the evolution of services marketing thought into three stages: “Crawling Out” (pre-1980), “Scurrying About” (1980-85) and “Walking Tall” (since 1986). Early research focussed on such topics as differences between goods and services, descriptions of the service sector and its importance, defining service characteristics, the distinctive nature of marketing channels for services, the service production process.

Two developments stimulated academic interest in services marketing in the early 1980s. One was the deregulation of service industries – such as transportation, financial services, healthcare and telecommunications – which led to intensified competition and greatly
increased the need for marketing. The second was a series of service-marketing conferences sponsored by the American Marketing Association, which brought together marketing academics and practitioners from all over the world. From the mid 1980s, there has been a growth in publications and empirical and theoretical rigor in research. International conferences have stimulated cross-fertilization of research and rapid diffusion of findings.

2.2 SERVICE MANAGEMENT

2.2.1 An integrated approach to service management:

The 4 P's classification of marketing decision variables which was created by Jerome McCarthly (1960) have been further increased keeping in view the distinctive nature of service performance as proposed by Bernard H. Booms and Mary J Bitner (1981) as 7 P's model of service management. According to them the services model includes the new P's as Participants, Physical Evidence and Process in addition to the existing 4 P's of product marketing. Later, Booms created a cartoon diagram showing seven little "Pea People" two of them carrying oars, lifting a peapod - shaped boat. Marketing cannot operate successfully in isolation from other functions in a service business according to this model. In order to develop effective strategies, an organisation must understand the implications of the seven components.

Three management functions play central and inter related roles in meeting customer needs, viz., marketing, operations and human resources.

2.2.2 Complaint handling and service recovery:

Oren Harari (1977) explained customer complaining behavior which featured a successful manager exclaiming: “Thank Goodness. I've got a dissatisfied customer on
the phone. The ones I worry about are the ones I never hear from”. Customers who do complain give a firm the chance to correct problems, restore relationships with the complainer and improve future satisfaction for all.

The TARP study on handling customer complaints:

The Technical Assistance Research Program institute, a research organisation has studied the handling of customer complaints in many countries (TARP, 1986). It published a landmark study based on its own research and a detailed review of other studies from around the world in 1986. Its findings which were widely publicised, prompted many managers to consider the impact of dissatisfied customers who switched over to a competitor. Some of the findings are:

- TARP found complaint rate of 17% among Japanese customers experiencing a problem with services and 36% among those experience a problem with goods. Similar results were found for other countries.
- Studies show that the majority of complaints were made at the place where the product was bought or the service received. Very few dissatisfied customers complained directly to the manufacturers or to the head office. In fact industry specific studies conducted by TARP suggested that fewer than 5% of complaints about expensive goods or services ever reached corporate head office presumably because intermediaries failed to pass them on.
- Research findings suggested that customers from high value purchases are likely to complain than those from low value purchases.
- TARP found three primary reasons why dissatisfied customers did not complain. In order of frequency, customers stated that
- they did not think it was worth the time or effort.
- they decided no one would be concerned about their problem or resolving it.
- they did not know what to do.

- Unfortunately this pessimism seems justified since a large percentage of people (40 – 60 percent in two studies) reported dissatisfaction with the outcome of their complaints.
- When complaints are satisfactorily resolved, there is a much better chance that the customers involved will remain loyal. TARP found that intention to repurchase different types of products ranged from 69 to 80 percent among those complainers who are completely satisfied with the outcome of the complaint. This figure changed from 17 to 32 percent for complainers who felt that their complaints have not been settled to their satisfaction.

2.2.3 Impact of service-recovery efforts on customer loyalty:

TARP argues that complaint handling should be seen as a profit centre and not as a cost centre. They have even created a formula to help companies relate the value of retaining a profitable customer to the overall costs of running an effective complaint handling unit. The return on investment ranges from 50 to 170 per cent for banks, 20 to 150 percent for gas utilities, over 100 per cent for automotive services and from 35 per cent to an astonishing 400 percent for retailing. Of course, in different industries and different countries, this formula may require some modifications. However, underlying these return rates is a simple fact. When a dissatisfied customer defects, the firm loses more than just the value of the next transaction. It may also lose a long term stream of profits from that customer and from anyone else who switches suppliers because of negative
comments from an unhappy friend. Thus, it pays to invest in service-recovery efforts designed to protect those long-term profits.

2.2.4 Customer feedback systems:

According to Jochen Wirtz, and Monica Tomlin, Arthur D.Little (2000), most companies understand the importance of complaint handling, customer satisfaction measurement and service recovery, and many firms have systems and procedures to do at least part of these activities. However, a few companies have implemented integrated customer feedback systems to systematically collect, analyse and disseminate various types of feedback coming into the firm and guide customer focused learning, continuous improvement and process redesign. Their work focuses on how to design and cost effectively run a completely integrated customer feedback system that ensures continuous learning and improvement in service quality as well as productivity. Many strategists have concluded that in increasingly competitive markets, the ultimate competitive advantage is to learn in order to respond and change faster than competitors (Baker and Sinkula, 1999). Jochen Wirtz and Monica Tomlin showed how customer feedback can effectively be collected, analysed and disseminated via an institutionalised customer feedback system that facilitates learning and supports a customer driven orientation. They have discussed the seven components of an effective customer feedback system which include:

1. Service indicators, standards and performance targets
2. Feedback collection tools and feedback process management
3. A reporting system
4. A Service Recovery System
5. An IT System
6. A Team Learning System and

7. Organisational positioning of a customer feedback system.

2.2.5 Developing and managing service indicators, standards and targets:

Established models such as SERVQUAL (Zeithaml, Parasuraman and Berry, 1988) together with discussions with customers and front line staff, serve to determine the service quality attributes that are important to customers and also for the attention of the management. SERVQUAL model has been described briefly in section 2.3.1

- **IT system concepts for customer feedback systems:**

  Feedback is given face-to-face to the frontline staff and to be able to capture that information, a convenient and easy system needs to be in place. Jochen Wirtz & Monica (2000) found intranet-based solutions to be extremely convenient and easy for staff to use and containing number of simple click as screens.

- **Service recovery system:**

  Often, customer queries or complaints cannot be fully resolved at the point of occurrence. For such cases, it makes sense to integrate service recovery into the customer feedback system. The feedback received is sent directly via email to the staff in charge of service recovery in the area of customer feedback, and a record of the case is created in a central database. This automated service recovery routing escalates to the next management level, if a case is not settled within 24 hours. Once a case is closed, for analysis and reporting purposes, it is kept in the central database together with all those cases that did not require recovery.
example for this is compliments, or cases that were recovered on the spot and entered into the system as a “closed case” (ibid Jochen Wirtz et al, 2000).

Designing a simple but effective reporting system: To drive continuous improvement and learning, a reporting system should be designed to facilitate feedback to frontline staff, process owners, branch or department managers and top management. The feedback loop to the front line should be immediate for complaints and compliments. Performance reports are recommended to provide the information necessary for service management and team learning. A monthly service performance update provides timely feedback on customer comments and operational process performance.

2.2.6 The service-profit chain:

James L. Heskett, Thomas O. Jones, Gary W.L. Loveman, W Earl Sasser, Jr. and Leonard A. Schlesinger (March-April 1994) dealt with the service profit chain relating profitability, customer loyalty and customer satisfaction to the value of services created by satisfied, loyal and productive employees.

According to them, service profit chain establishes relationships between profitability, customer loyalty and employee satisfaction, loyalty, and productivity. The links in the chain are as follows: Profit and growth are stimulated primarily by customer loyalty. Loyalty is a direct result of customer satisfaction. Satisfaction is largely influenced by the value of services provided to customers. Value is created by satisfied, loyal and productive employees. Employee satisfaction, in turn, results primarily from high quality support services and policies that enable employees to deliver results to customers.

Their established relations are as under:
• Customer loyalty drives profitability and growth.
• Customer satisfaction drives customer loyalty
• Value drives customer satisfaction
• Employee productivity drives value
• Employee loyalty drives productivity
• Employee satisfaction drives loyalty
• Internal quality drives employee satisfaction

2.2.7 Studies on relationships between various service parameters


Robert Johnston (2001) investigated some of these relationships with regard to non-standard service performance, i.e. service failures leading to customer complaints.

2.2.8 Complaints and complaint management

Complaints are a natural consequence of any service activity because “Mistakes are an unavoidable feature of all human endeavor and thus also of service delivery” (Boshoff
Service recovery is the process of putting the situation right (Zemke and Schaaf 1990, Berry and Parasuraman 1991) though it has been defined more widely and more proactively as the action of seeing out and dealing with failures in the delivery of service (Johnston 1995). The term “complaint management” is used here to include service recovery and involves the receipt, investigation, settlement and prevention of customer complaints and recovery of the customer. A good deal has been written on complaint management including: the nature of complaining behaviour (Halstead 1989, Feinberg et al 1990, Singh 1990, Johnston 1998); the importance of managing complaints and the value of service recovery (Berry and Parasuraman 1991, Hart et al 1990, Johnston 1995, Barlow and Moller 1996, Brown et al 1996); developing measurement instruments (Cooper et al 1989, Boshoff 1998); elements of recovery and recovery strategies (Barlow and Moller 1996, Boshoff 1997, Boshoff and Leong 1998, Johnston and Fern 1999); and more recently service recovery applied to internal customers (Bowen and Johnston 1999).

The complaint management process:

The interest in complaint management, from an operations perspective, is the process by which complaints are handled and customers recovered. The design, planning, control and execution of these processes are core operations tasks. Several factors have been identified to suggest what is meant by a “good” complaint management process, Heskett et al. (1990), Johnston (1995), Barlow and Moller (1996), Boshoff (1997), Van Ossel and Stremersch (1998). These include:

- having clear procedures
- providing a speedy response
- the reliability of response
• having a single point of contact for complainants
• ease of access to the complaints process
• ease of use of the process
• keeping the complainant informed
• staff understand the complaint processes
• complaints are taken seriously
• employees are empowered to deal with the situation
• having follow-up procedures to check with customers after resolution
• using the data to engineer-out the problems
• using measures based on cause reduction rather than complaint volume reduction.

2.2.9 Conceptual model

Robert Johnston (2001) has undertaken the work of investigating the effect of complaint management on profit & growth. The objective of his work is to propose a conceptual model showing the relationship between complaint management processes and profit & growth. He has undertaken some preliminary testing of that model. The underlying hypothesis is that good complaint processes generate profit & growth.

The underlying assumption is that the prime purpose of designing and developing robust and effective complaint management systems is to deliver enhanced profits by increasing revenues and reducing costs.

Research has shown that excellent complaint management and service recovery can significantly influence customer satisfaction (Berry and Parasuraman 1991). Furthermore in an earlier study it was found that the majority of highly satisfying (delighting) experiences were the result of something going wrong and the organisation making the
effort to recover the customer. "The recovery of failures can provide a major opportunity for organisations to create very satisfied customers. If mistakes and failures are an inevitable part of service, then there are opportunities for organisations to create very satisfied customer" (Johnston, 1995). The critical issue about complaint management is that it is not necessarily that the failure itself leads to customer dissatisfaction, many customers accept that things can go wrong. It is more likely to be the organisation's response or lack of response to a failure that causes satisfaction or dissatisfaction (Bitner, Booms and Tetreault 1990, Feinberg et al 1990). The impact of satisfaction on retention has been well documented (Rust and Zahorik 1993, Anderson et al 1994, Jones and Sasser 1995, Rust et al 1995, Loveman 1998). Effective response to failures is also believed to have a high pay off in terms of customer loyalty (Heskett, Sasser and Hart 1990, Berry and Parasuraman 1991, Bailey 1994, Spreng et al 1995, Van Ossel and Stremersch 1998). As Hart, Heskett and Sasser (1990) explained “A good recovery can turn angry, frustrated customers into loyal ones”. Indeed research on satisfaction with complaint processes specifically, has also shown a clear relationship with loyalty and repurchase intentions (Halstead and Page, 1992). Research by Jones and Sasser (1995) found that customers who were just “satisfied” were significantly less loyal than delighted customers. Given that a large proportion of delighting outcomes were the result of service recovery (Johnston, 1995) this would suggest that service recovery could be an important loyalty level. Furthermore, customers who have been successfully recovered not only remain loyal but can become advocates for the organisation (Barlow and Moller, 1996). Such advocates may then be a source of referral business because word of mouth can be very persuasive in terms of influencing customers to use an organisation and its
services (Spreng et al, 1995). Customer retention has been shown to have a direct impact on revenue and profitability (Rust and Zahork 1993, Anderson et al 1994, Rust et al 1995, Loveman 1998). Loyal customers continue to purchase the service, generate long term revenue streams, tend to buy more and may be willing to pay premium prices, all of which increase revenue and profitability. Further, it has been shown that customer loyalty is a more important predictor of profitability than market share (Reichheld and Sasser 1990, Reichheld 1996). Loyal customers may also lower marketing costs since retaining customers is usually significantly cheaper than attracting new ones (Peters 1987). Simply put “Customer loyalty drives profitability and growth” (Heskett et al 1994). Furthermore, since negative word of mouth is likely to result from customer dissatisfaction, not satisfying complaining customers may have a potentially greater negative effect on business earning than that which is lost through the customer alone (Van Ossel and Stremersch, 1998). A key benefit of complaint management is that complaints can also be used to support the drive for continuous improvement by focussing managerial attention on specific problem areas (Van Ossel and Stremersch 1998, Slack et al 1998). This potential, however, is often overlooked. “Customers are often flooded with promises that the system has been changed for the future, but they are often left with the feeling that they have basically expected too much, and any action is a goodwill gesture on the part of the service provider” (Armistead and Clark, 1994). Complaints should lead to the identification of problems and action to ensure that such failures do not happen again. Indeed research carried out for the citizens charter unit in the UK (Mori 1997) found that about 50 per cent of people complain in order that the organisation might improve its services. It was also reported that that only 1 in 10 felt that the service had improved as a
result. Spreng et al (1995) concluded that although service recovery processes and programs can be expensive, they should also be viewed as opportunities to make improvements that will ultimately result in more satisfied customers, and also lead to cost reduction through those improvements preventing future service failures. Improving operational and organisation-wide processes may represent a cost to the organisation and therefore have a negative impact on financial performance. Improving processes, increasing staff, redesigning jobs, increasing capacity, improving quality, for example are all likely to incur costs. On the other hand improvements may reduce costs in the longer term, not only processing costs but costs associated with absenteeism and attrition as employees feel the effects of having to deal with unresolved problems and irate customers (Bowen and Johnston 1999). Such improvements do not need to be linked to customer complaints. More proactively changes can be made by involving employees in identifying problems and potential problems. “Service employees should be both inspired and obliged to provide information accurately and consistently about service failure or recovery, which management then can use to redesign the system” (Brown et al, 1996). Good complaints processes, that are easy to use and satisfy customers, should result in employees feeling of greater control over the work situation and thus less stress (Matteson and Ivancevich, 1982). In turn, less stress tends to be associated with greater job satisfaction and organisational commitment, better job performance, and health (Fox, Dwyer, Ganster 1993, Motowidlio, Manning and Packard 1986). A good attitude towards the job should then result in less stress, attrition and absenteeism and greater staff loyalty and retention, which should have a direct impact on profit & growth. Organisational culture, in terms of visible structures and processes, strategies, goals and philosophies or
unconscious beliefs, thoughts, and feelings (Schein 1985), exerts a powerful influence on organisational and operational processes. In particular, organisational culture underpins the creation of a customer-focused organisation or organisations committed to service excellence (Johnston and Scholes 1993). It is suggested that organisational culture regarding complaints, such as the way it values complaints, whether complaints are seen as a nuisance or a gift will have impact on the quality and robustness of the complaint processes (Barlow and Moller 1996, Handy 1991, Kakabadse and Kakabadse 1999).

2.2.10 Service as a business imperative in manufacturing & IT

Valarie A, Zeithaml & Jo Bitner, (2000) feels that early in the development of the field of service marketing, and management, most of the interest and impetus came from service industries such as banking and health care. As these traditional industries continue to evolve and become more competitive, the need for effective service management and marketing strategies started increasing. Now, however, manufacturing and technology industries such as automobiles, computers, and software are recognizing the need to provide quality services in order to compete worldwide. These companies are also realizing that a large percentage of their revenues and profits are coming from services.

Claudia H Deutsch (Jan 7, 1997) in the publication “Services becoming the goods industry” writes “From General Electric to Wang, from Xerox to Hewlett-Packard, companies that a few years ago got almost all of their profits from selling widgets are rapidly transforming themselves into service providers”. At General Electric (GE), Chief Executive Officer (CEO) Jack Welch launched what has been the “third revolution” in an effort to boost growth to double digits. A major thrust of the third revolution is a push to move GE ever deeper into services. This includes every thing from maintenance
services for products GE produces such as medical imaging equipment to financial services (GE Capital), management and consulting.

In most industries, providing quality service is no longer simply an option. The quick pace of developing technologies and increasing competition makes it difficult to gain strategic competitive advantage through physical products alone. Plus, customers are more demanding. They not only expect excellent, high-quality goods: they also expect high levels of service along with them.

In a company brochure, IBM – the computer manufacturer – states that it is the largest service business in the world. Services are leading IBM’s growth strategy (IBM Global Services, 1997). Through its Global Services division, IBM offers product support services, professional consulting services, and network computing services around the globe. These services are demanded by its customers. By providing them IBM expects to grow in revenues and profits and enhance its competitive advantage in the industry. As manufactures and IT companies such as GE and IBM become more and more service-focussed, the need for special concepts and approaches for managing and marketing services becomes even more apparent.

2.2.11 Customer centered service

E-gain white paper (2001), deals with customer loyalty as part of customer centered service. The aspects are:

- Keeping customers loyal

  According to Reichfield, Frederick F(1996), in most industries and market segments, there is no doubt about the role of customer loyalty as a significant contributor to a company’s long term success. As an existing customer is already
familiar with company's products, many steps in the sales cycle are eliminated or considerably reduced. Even when the company introduces new products, it is easier to sell into the existing customer base than it is to sell to new customers. Existing customers, if they like doing business with the company, they are more likely to, at least look at company's new offerings. Studies reveal that a loyal customer base can be a great advantage. A shift in customer retention of as little as 5 percent, account for more than a 20 percent improvement in productivity, which in certain industries can increase profit by 50 to 100 percent.

It is important to seize every opportunity to build up loyalty among customers so that they keep coming back. Repeat customers also tend to provide good references, and can be an invaluable resource when selling to new accounts. As listed out in the white paper, some of the challenges are:

- It is easy for customers to switch to competitive products and services.
- The fact remains that new competitors enter the arena any time. The company has to find ways to be in tune with customers, and proactively discover and address their changing needs.
- Customers' expectations are constantly rising.

Customers want everything better, faster and more. As customers become busier, they demand instant gratification, and expect things to work exactly the way they want them to work, and it takes a lot more to keep them loyal than it did a few years ago. Customers whether individual consumers or business organisations are no different. The bar of "acceptable" (Reichheld, Frederick F, 1996, page 13) customer service is constantly being raised. In fact, meeting customer
expectations just gets you onto the playing field; to be competitive, you have to exceed customer expectations and have customer raise the bar to the point where the competitors cannot compete with the company.

- **Customer data is fragmented.**

Customer data resides in many different systems—a customer's financial history may reside in the enterprise resource planning (ERP) system, the customers support history may be in one or more customer relationship management systems and so on. This makes it difficult to have meaningful sales or service interactions with a customer. It is very frustrating for a customer to be asked to contact one part of the company to handle accounting queries and another to track the status of previous service incidents. And it is frustrating for customer service representatives not to have access to all the customer information they need to do their jobs well.

Customer centered service is an approach that considers company’s customer service delivery from the perspective of the customer, with a view to gaining trust and building loyalty and referenceability. It takes into account the business needs of the company, and then develops customer service systems in a way that is relevant to customers’ needs. It ensures that technology is implemented in a manner that helps the company to maximise the return on investment. And it allows the measurement of the success of Company’s efforts and make changes as business and customer needs change.

Customer service delivery systems should be easy to use and user friendly. Indeed, customer service systems should be designed and developed and given the
full thought and rigour they deserve. Customer centered service provides that discipline through its five principles: (ibid Reichfield Frederick F, 1996).

1. Setting business goals for customer service
2. Understanding user requirements
3. Designing the customer service experience
4. Selecting technology and implementing the design
5. Measuring, understanding, and adapting.

- **Customer service business goals.**

Introducing customer service requirements into the service design and development process will give in enormous returns. In computer products, the descriptive error messages with trouble shooting suggestions can significantly reduce the number of service calls you receive. The customer service organisation exists to handle inquiries and issues from the customer base. Objectives of the service organisation should be such that a customer service organisation existing is not simply because all competitors have one. It is because the company customers expect some service on the products they have purchased, and company realised that they have to do it. The service department in the company is responsible for customer loyalty and referenceability.

- **Customer requirements.**

Companies that implement customer service delivery systems without taking into account what their customer wants and needs are, can result in a system that is technically superior, but irrelevant to customers. Customers, when they come in contact with such a system, are frustrated. If this goes on long enough, customers
will leave for other companies that know their customers better. The second principle of customer centered service is to understand and deliver on the service needs of the customer base.

Customers fall into different segments and to identify requirements specific to each segment, the company should have information such as:

- Whether the Company have customers who want to serve themselves, and not interact with a customer service representative at all.
- Whether there are others who want a live interaction for every service transaction.
- Whether company’s customers want some kind of personalisation, so that they can track all their service interactions.
- Whether company's customer base is sophisticated with regard to their usage of technology.

**Service experience**

The White Paper mentions about a technically superior system that is irrelevant to customer needs. When designing a customer service delivery system, company must account not only for the technology and the relevance of the system to customer needs, but also the kind of service experience the company wants customer to have. After all, even if the best technology is used with the most relevant service system, if customers don’t feel good after using the system, then the company has not made much progress. The third principle of customer centered service: Designing for the service experience.
The best way to think of service experience is to imagine how the company wants customers to feel during and after service interactions. The question arises whether the company wants customers to think. Some companies do an excellent job in delivering a positive service experience. Their customers feel that they receive value out of every service transaction, and begin to count on the service organisation of the company.

Some factors that enhance the service experience, independent of the delivery channel, include:

- **Responsiveness** – how quickly the customer is able to get the service needed. In a self service situation over the internet, responsiveness manifests itself in a well laid out, easy to navigate web site with superior performance. In a telephone service situation, it means that hold times are low, navigation menus are few and brief. When customers want service they want it fast.

- **Effectiveness** – getting the service need addressed with a minimum number of interactions. A customer seeking self service over the internet should be able to easily get that service, be it a knowledge base search or a sales transaction, without having to complete the transaction by interacting with the customer service representatives, and without having to switch to using a telephone. Similarly, in a telephone service environment, customer service representatives should have enough knowledge at their fingertips to quickly and completely satisfy customer service needs.

- **Personalisation** – recognising who is requesting the service, and satisfying the service need in a manner that shows the company’s awareness of that. In a web
support scenario, the company may create personalised pages for each of their customers, recognise where they were when they requested service, and give them content what they expect the service need. Company can also give them the opportunity to look at new offerings similar to past purchases.

- **Technology considerations**

  The fourth principle of customer centered service is: to select and use appropriate technology to implement the customer service system. Company must have a clear understanding of what the company does for customers. It is important for the implementation of technology to take place after knowing the goals and have a design and a plan. Not all companies are the same, and certainly not all customers are the same. Whatever technology the company select must be able to address company's needs. The demands placed on the customer service system will change frequently and rapidly. Accordingly, the two key attributes of any technology, the company select are: (1) easy to implement and change, and (2) to customise it to suit the company and customer base making it flexible.

  Beyond that, there are some functional considerations. Well designed and implemented customer service systems offer customers a consistent and appropriate service experience across all interaction channels. In other words, the company needs technologies that enables to offer email, chat, self service, and telephone interactions that are similar in quality and content. Such systems are called Enterprise Interaction Management systems.

  - These interaction systems, obviously have a component to manage individual interactions with customers. Two other functions they include are:
o A strong and robust knowledge management system that allows to create, organise and disseminate service related knowledge. This is needed to enhance not only self service, but also to ensure that the same content is available across all interaction channels.

o A simple yet powerful capability to integrate with other systems in the enterprise is called "legacy integration." This ensures that all the information needed to satisfy a customer service request is readily available to the customer or the customer service representative.

Another important technology consideration is, of course, the technical architecture of the system. As mentioned earlier, customers want fast responses and if the system cannot scale up under heavy loads then it becomes a potential issue. Similarly, the company want customer service system to be highly reliable, so that customers will be able to get service whenever they want it.

Well designed customer service systems rely on proven technology and are benchmarked for scalability and reliability to show how they perform under pressure.

**Measurement and analysis**

The fifth and final principle of customer centered service is: constantly measuring, analysing and adapting customer service delivery performance. Customer preferences evolve in unexpected ways. In these days of rapid change, it is required to have a rigorous measurement system in place, and frequent analysis of those measurements. This analysis can give invaluable insights into customer behaviour as well as advance notice of changes in behaviour.
One of the biggest advantages of using advanced technology to deliver customer service is that it quickly develops a comprehensive record of every service interaction with customers. Company have visibility into what their service issues are, how they interact, which channels they prefer to use for customer service, how each service issue was resolved, and so on will be established. This is a vast amount of information that can be very valuable if used appropriately.

2.2.12 Difficulties in delivering premium customer service:

As per Jerry Ryan, ATG (2000), the difficulties in delivering premium customer service are:

- **Higher customer expectations**

  Across all industries, customers expectations are rising. This is particularly true among the most affluent and valuable customers, the company most want to attract and retain.

  These customers are demanding instant access to the companies they do business with. People want to conduct their business at a time that is convenient for them.

  Customers are also expecting to contact the companies they do business with via the web and email as well as through the telephone; and they want a consistent level of response.

  Customers are also demanding more personal service. When they contact a company with whom they have a relationship, they want the customer service representative (CSR) to know who they are and to understand their needs.
• **Tougher competition**

As a result of deregulation, globalisation and new technologies, many companies are facing stiffer competition. In this more competitive environment, attracting and retaining loyal and valuable customers is even tougher.

• **Broader, more complex product offerings**

Today many companies are selling more products and services to customers, and those products and services are more complex. In the case of telecommunications companies for example, they are now offering much more than simple telephone service. Their product line often includes wireless communications, internet access, application hosting and other services for residential and business customers.

Jerry Ryan adds that customers, more broadly, would prefer to deal with companies through the online media, email and the internet in addition to the telephone. For example in USA, some dot.com companies receive in excess of 10,000 emails each week from customers. Unfortunately, however, many companies are unequipped to handle this volume and emails go unanswered for days or weeks.

The potential for companies to offer services online is growing rapidly as more customers get access to the internet, but many customers are frustrated with their online experience.

Customers expect companies to recognise and remember them every time they communicate, regardless of whether the customer makes an inbound call to the company or the company makes an outbound call to the customer. Customers are
frustrated, for example, when they call a company in the morning about a maintenance problem, and they get a call later that same day from a customer service representatives in the company’s collection department who is completely unaware of the earlier contact.

Jerry Ryan lists out the technologies, applicable to customer service as below:

- Efficient contact handling
- CSR information access
- Voice and data transfer between CSRs
- Intelligent call routing
- Inbound and outbound call blending
- Integrated telephone, email and web contact management
- Web call back
- Integrated inbound and outbound contact

2.2.13 Engineering customer expectations

According to Steve Haeckel and Lewis P. Carbone (2003), engineering customer experience is an important and largely unexploited strategy for establishing and maintaining customer preference not for a set of products and services, but for an institution.

They further add that customers always get more than they bargain for, because a product or service always comes with an experience – the “takeaway” impression formed by peoples encounters with products, services and business. If systematically crafted into positive net impression, performance and context based clues promote customer preference.
Haeckel & Lewis feels that engineering an experience begins with deliberate setting of a targeted customer perception and results in the successful registration of that perception in the customer’s mind. Systematically designing and orchestrating the signals generated by products, services, and the environment is the means to that end.

Experience management is primarily concerned with the context clues that are emitted by the product or service and the environment: It is therefore, distinct from product and service design.

While some business leaders seem to be “naturals” at orchestrating experiences, the prominent of them being Walt Disney and McDonald’s founder R Kroc. They turn to new management disciplines and tools. These include a systematic approach to creating, implementing and measuring the impact of experience clues that:

- is based on a set of principles differentiating the essential from the optional, and what is likely to work from what is in
- incorporates a robust methodology
- establishes a symbolic mechanism for communicating the customer experience design throughout the organisation

Steve Haeckel and Lewis Carbone (2003) lists out a few points on experience engineering:

- Assuming control with style; style must be consistent with the targeted perception of the experience, and should not come across as manipulative
- Integrating “mechanics” and “humanics” for maximum effectiveness – Mechanics are the sights, smells, tastes, sound and textures generated by things, for example, landscaping, graphics, scents, recorded music, handrail surfaces an so on.
Humanics clues emanate from people. They are engineered by defining and choreographing the desired behaviour of employees involved in the customer encounter.

- Aiming for thematic "Sticktion" - In the context of experience management, engineering term refers to a limited number of special clues that are sufficiently remarkable to be registered and remembered for some time. Sticktion stands out in the experience, but does not overpower it; well designed, it is both memorable and related to the "motif" of the experience. Sticktion can be very powerful in generating and perpetrating the kinds of myths and legends built up over decades around icons such as Disney, AT&T and WalMart in USA.

Integrating process and experience designs - The process of designing preference creating experiences must be intimately related to the multinational, training, financial and operational business processes of a company. Business process design entails the identification and sequencing of tasks, resources, decisions and human accountabilities that define the behaviours needed to run the business. To them can be added processes for delivering the humanics and mechanics that establish a differentiating experience along with the product or service.

2.3. SERVICE QUALITY

2.3.1 Service quality model

Service quality model is a model of how the quality of services is perceived by customers. When the service provider understands how the services will be evaluated by the users, it will be possible to identify how to manage these evaluations and how to influence them in a desired direction. The relationship between the service concept, the
service offered to customers, and customer benefits has to be clarified (Eiglier & Langeard 1981).

The interest in service quality has increased exponentially during the 1980s. In the services marketing literature a service oriented approach to quality was introduced by Gronroos in 1982. Then came the concept of perceived service quality and the model of total service quality (Gronroos 1983 and 1984). The perceived service quality approach still seems to form the foundation for most of the ongoing service quality research and theory development in services marketing (Lehtinen & Lehtinen 1982, Berry et al. 1985, Parasuraman et al. 1985, Lehtinen 1986, Gummesson & Gronroos 1987 and 1988, Zeithaml 1987, Zeithaml et al. 1988, Lindquist 1988, Crosby 1988 and Crosby et al. 1988). There are, however, attempts to study service quality from other perspectives (Hedvall & Paltschik 1987, Orsini & Meyer 1987).

In the area of service management the quality issue is addressed to some extent (Normann 1984), as it is in service operations (Wyckoff 1984, Johnston 1989, Haywood-Farmer & Stuart 1988, and Lyth & Johnston 1988). However, far less comprehensive model building seems to have taken place within these areas as far as service quality is concerned.

- **The SERVQUAL model:**

  To gain a thorough insight into many issues of service quality, two different methods can be applied: qualitative and quantitative methods. Examples of qualitative techniques are individual or group interviews with users, periodic interviews with the same group of users, and complaint analyses. Examples of quantitative techniques are the large scale surveys with questionnaires, analyses

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of the number of complaints or the number of credit notes and the use of them as an indication for corrective action.

Zeithaml, Parasuraman and Berry's Servqual model, can be operationalised by both qualitative and quantitative research. However, till now the SERVQUAL model is mainly used in quantitative research (consisting of questionnaires). In the SERVQUAL model, a distinction is made between the customers and the organisation which consists of managers and other front office and back office employees working in various units and levels within the whole service organisation. The user quality is measured as the differences between the expectations and perceptions of customers.

- **Users quality**

  The SERVQUAL model defines quality as the difference between customers' expectations and perceptions of the service delivered. To measure quality, the respondents are asked to answer two sets of questions, dealing with the same subject. For example, customers of a service organisation are asked:

  o employees in excellent organisations will give prompt service to customers

  o employees in organisation XYZ give prompt service.

  o Customers complete these two questions on a 5, 7 or 9 point Likert-scale, indicating the degree to which they agree with the statement. For each subject and for the total service a quality judgement can be computed according to the following formula:

    Perception - Expectation = Quality

    or P - E = Q
This formula implies the following in talking about service quality: if expectations exceed perceptions, quality obviously is poor and if perceptions exceed expectations, quality is excellent. This way of reasoning implies that two curious situations may exist.

- if consumers have low expectations which are met, quality exists; and
- if consumers receive more and better services than they need, excellent services are delivered. The quality level then may be too high for these customers

- All these situations indicate that excellent service delivery is a delicate matter. A service provider must have thorough knowledge of customer expectations. The provider must also be able to forecast competitors' behaviour. In the latter situation, the service provider can hardly keep expectations low, if competitors deliver higher quality.

Service quality can be influenced in two ways. Not only a higher performance can affect service quality positively, the same effect can be achieved by lowering the expectation level. However, competitors' behaviour should be taken into account in this particular situation. Considering competitors' offerings, it might not be wise to lower quality expectations. In the long term, maintaining high expectations only make sense if performance is equal to these expectations. So, managing expectations is crucial to service firms. Here, marketing management and all contact personnel have to play an important role although the whole internal organisation (front and back office) contributes to accomplish a certain level of service quality.
Quality is what customers perceive

Literature on services marketing (Gronroos 1983 and 1984, Parasuraman et al. 1985, Zeithaml 1987, and Zeithaml et al. 1988). Quality, and service quality in particular, is such a complex phenomenon that a much more detailed model than the ones normally used is needed. As Garvin puts it: "must break down the word quality into manageable parts. Only then can they define the quality niches in which to compete" (Garvin 1987).

Quality dimensions: What and how

Basically, the quality of a service as it is perceived by customers has two dimensions, namely, a technical or outcome dimension and a functional or process-related dimension (Gronroos 1983 and 1984; Parasuraman et al. 1985 and Lehtinen 1986). What customers receive in their interactions with the firm is clearly important to them and to their quality evaluation. Internally this is very often thought of as the quality of the product delivered.

The customer is also influenced by how they receive the service and how they experience the simultaneous production and consumption process. This is another quality dimension.

Quality and the competitive edge

Based on the PIMS (Profit Impact of Market Strategy) data base, including information from manufacturers and service firms alike, customer perceived quality is found to be of exceedingly great importance to success (Buzzell & Gale 1987). The competitive advantage of a firm is said to depend on the quality of the goods and services provided. As Lee Iacocca, Chairman of Chrysler, puts
it in his straightforward words: “The only job security anybody has in this company comes from quality, productivity and satisfied customers” (Lacocca 1988). The same goes for manufacturers and service organisations alike. However, because of the complex nature of quality in service contexts, one has to be more explicit. In service contexts, quality may certainly be the foundation of the competitive edge, but the question ‘which quality dimension forms the vital part of excellent total quality’ is not answered correctly. Wrong internal actions may be taken and a stronger competitive position is not achieved at all.

- **Perceptions of total service quality: Some research results:**

  During the 1980s, studies of factors that influence the total perceived quality have been reported. This is a field of research that is being explored to a considerable extent right now, so more information will be available in due course. In the study that was conducted by Berry and his colleagues from Texas (Parasuraman et al. 1985), one of the ten determinants, (the ten determinants are not listed here in this literature survey), competence, is clearly related to the technical quality of the outcome, and another, credibility, is closely connected to the image aspect of perceived quality. However, it is interesting to observe that the rest of the ten determinants are more or less related to the process dimension of perceived quality. The importance of the functional quality dimension is much stressed by these findings.

2.3.2 The six criteria of good perceived service quality.

In order to make such lists of determinants or factors of good service quality useful for managerial purposes, they have to be short enough to provide a comprehensive
list of aspects of good quality, which have to be taken into account. Based on the above study of Berry & his colleagues from Texas, six criteria of good perceived service quality are listed as below:

- **Professionalism and skills**
  The customers realise that the service provider, its employees, operational systems, and physical resources, have the knowledge and skills required to solve their problems in a professional way (outcome-related criteria).

- **Attitude and behaviour**: The customers feel that the service employees are concerned about them and interested in solving their problems in a friendly and spontaneous way (process-related criteria).

- **Accessibility and flexibility**
  The customers feel that the service provider, its location, operating hours, employees, and operational systems, are designed and operate so that it is easy to get access to the service and so that they are prepared to adjust to the demands and wishes of the customer in a flexible way (process-related criteria).

- **Reliability and trustworthiness**
  The customers know that whatever takes place or has been agreed upon, they can rely on the service provider, its employees and systems, to keep promises and perform with the best interest of the customers at heart (process-related criteria).

- **Recovery**
  The customers realise that whenever something goes wrong or something unpredictable unexpectedly happens the service provider will immediately and
actively take actions to keep them in control of the situation and find a new, acceptable solution (process-related criteria).

- Reputation and credibility

The customers believe that the operations of the service provider can be trusted and gives adequate value for money, and that it stands for good performance and values which can be shared by customers and the service provider (image-related criteria).

2.3.3 Measuring and controlling quality

Quality is difficult to define when one's offering is all or partly intangible. We cannot see, touch, or compare service offerings using the same standards we use to compare products. Perceptual and real comparisons are made, though, each time a customer selects one vendor over another. Therefore, important tasks for service providers are to define quality in meaningful ways, develop appropriate measures of quality for their offerings, and use those measured to constantly gauge and improve their level of quality.

Service providers are often concerned that there is no way to develop and use a complex array of quality measures without taking too much valuable time away from customers. They are concerned that productivity will decline if they spend too much time measuring quality. After all, once a set of measures is developed it takes time to remain up to date on how well the business is performing on each dimension and to implement corrective action as needed.

A compelling response to this concern is offered by W. Edwards Deming, an early advocate of achieving the highest levels of quality possible in industry. In the late 1970s US firms started to think about applications for his ideas, and his work is now well
known and respected in his home country as well as abroad. Deming developed a 14 point program to improve and maximise the level of quality in any industrial setting — regardless of whether the offering is a product or a service.

Demings 14 points can be used to evaluate and change a service organisation in ways that improve both quality and productivity.

1. Creating constancy of purpose because there are only three reasons to be in business viz., becoming competitive; meeting customer needs; remaining in business over a long period of time;

2. Adopting a new way of doing business.


4. Minimising long-term supplier costs by developing long-term trusting relationships with suppliers.

5. Forever, constantly seeing ways to improve operations and reduce costs.

6. Making on the job training an integral part of every employee's job.

7. Always remembering that the goal of management is to improve performance.

8. Eliminating fears, to allow everyone to become more effective.

9. Eliminating departmental barriers: focus on all departments' support.

10. Expecting what employees are to perform or change within their control.

11. Relying on leadership instead of management by objectives.

12. Removing all barriers to pride in one's work; allowing every employee to feel important and successful.
13. Instituting an on-going programme of education and self-improvement for all employees.

14. Making organisational transformation everyone’s job – it takes the whole company to make quality improvements happen.

2.3.4 The concept of a service quality information system

Berry, L.L and A. Parasuraman (April 1997), listed out five elements of the service quality information system given as under:

1. Measurement of service expectations: Companies frequently measure only customers’ service perceptions, when they should be including their expectations about level of service, both what they desire and what they deem adequate. Expectations provide a frame of reference when considering customers’ perceptions ratings.

2. Emphasis

3. Sizing information quality: In evaluating information, companies should ask if it is relevant, precise, useful, in context, credible, understandable, and timely.

4. Capture customers’ words: The system should include both quantitative and qualitative databases. Qualified data are more meaningful when combined with customers’ verbatim comments.

5. Link service performance to business results: What impact does the service performance have on business results?

6. Companies need to calculate lost revenue due to dissatisfied customers, measure customers’ repurchases, and gauge the relationship between customer loyalty and inclination to switchover.
7. Reach every employee: Companies should disseminate customer feedback to all employees. They are decision makers who affect the quality of service at all levels.

Berry and Parasuraman suggest that managers need to make ‘listening to customers’ a habit and find ways to personally hear customer feedback. Only then can they make decisions to improve service.

2.3.5 Service quality and customer orientation - a strategic competitive factor.

In the white paper from Softlab, Stefan Masset (1999), says about customers that now a days customers are very well informed, know how to compare the performance of various providers and quality expectations from service provision are increasing all the time. So a company can no longer, simply by providing a service, develop a distinctive identity to make it stand out and withstand the competition in a market becoming progressively tougher. The commitment of the management to a consistent orientation towards customers and thus to higher service quality is the necessary prerequisite for lasting success in the market.

Stefan Masset (1999) says, the way to service quality and identification with it has consequences:

The management must be able to openly listen to the views of the customers. The customer expectations show the way for a company to be effective. The creation of structures and products/services offered should therefore to the greatest possible extent, be guided by customer needs and not by the company’s internal requirements.
Stefan Masset discusses the importance for a high level of service quality. Customer satisfaction can only be achieved if the customer is enthusiastic about the range of services of the provider. Good service, tailored precisely to the needs of the customer, puts a company in a position to hold on to customers for a lifetime and as a result to make money.

In addition to these basic possibilities for increased success, efforts to provide a better service give more opportunities to develop the company and its products continually. According to Stefan Masset, a decisive factor for success is that of exposing existing weak points in the service process and the relevant change to the customer oriented service processes.

First, by filling the gaps between customer expectations and the service actually provided, the potential weak points in the system are identified. Then, requirements must be specified by systematically conducting customer, employees and management questionnaires. The potential for improvement to service quality revealed in this way serves as a starting point for the precise analysis of critical service processes.

To attain a suitable service culture, almost all areas of a company must be taken into account when it is introduced. The personal and skill development of employees, the intensification of market research and the introduction of an active complaint management system are just a few examples of measures needed on the way to improved customer orientation.
2.4 TECHNOLOGY IN SERVICES

2.4.1 The Meaning of technology

Every generation tends to use the word technology to describe, loosely, the practical application of cutting edge tools and procedures. Many people link technology to the developments in IT. It is important not to define technology too narrowly, because there is much more to the technological transformation of services than just IT. In fact, at least six types of technologies have implications for the service sector. These are the technologies of power and energy, physical design, materials, methods, genetic biology and information. All these technologies have important implications for services marketing. However, the focus is made on IT and telecommunications as they are currently revolutionising services marketing.

- Information technology and innovation.

New and different types of technologies permit service businesses to do things that were not previously possible and to do existing things better or more productively.

Today, everybody's eyes are on the internet, whose early marketing applications first started attracting attention in the mid-1990s. Some of the service marketing activities that the internet permits are simply enhancements of what was previously done by mail, printed brochures or telephone calls. Others represent a radically new approach to doing business, based upon digital technology.

Driving modern IT applications is the merger of two separate technologies – that of computers and telecommunications. George Gilder described this phenomenon back in 1991 as "One of the greatest transformations – perhaps the greatest transformation – in the history of technology" (George Gilder, 1991). Underlying this global revolution,
which Gilder describes as a change that "leaves all previous technological history in its wake", are five key drivers:

- An enormous and sustained increase in computing power, paralleled by a rapid fall in the cost of this power (Moore's Law predicts a doubling of computing power for the same price every 18 months).

- Digitisation of all types of information so that they can be stored and manipulated in the binary language of computers.

- A huge increase in the capacity of telecommunication links as new satellite and microwave linkages are installed and as fibre-optic cables replace conventional "twisted pair" and coaxial cables.

- A miniaturisation of hardware and batteries that makes it possible to create a wide range of portable telecomputing devices.

- Advances in software, digital switching technology and network architecture that enable high quality voice, picture and data transmissions to move seamlessly between different types of terminals located all over the world.

Collectively, these developments are driving the rapid evolution of the internet and its best known component, the World Wide Web. As a global "network of networks", the internet comprises huge numbers of servers (large computers that control customer e-mail and web pages) around the world. The challenge for service managers is to decide how best to use this enormous potential. As an example, this challenge is being met by Hongkong & Shanghai Banking Corp. According to Mr. Aman Mehta, Hongkong Bank CEO, "HSBC spends something like two, two and a half billion (US) dollars a year on IT. I think our total IT
expense as a portion of operating costs is around 12 per cent. That’s edging up, to the 14-15 per cent range. We are planning on a long term basis. So we have no plan to cut. "IT spending" according to Mr. Aman Mehta of HSBC

2.4.2 Customer service technology today

Customer service and support has proven to be one of the most potent areas for the deployment of technology in business today. The effective use of customer facing technologies is enabling organisations to get the following benefits (Right now technologies, 2002).

- **Smarter call centers**

  Effective customer service operations depend heavily on a variety of call center technologies, including automated call distribution (ACD) switches, interactive voice response (IVR), computer telephony integration (CTI) and call monitoring/recording functions. Using these technologies, companies can efficiently distribute incoming calls to minimise wait-times and to ensure that calls are routed to customer service representatives (CSRs) with specific expertise. They can implement touch tone and or voice prompts that let customers provide information about the reason for their call, or even lead them to find answers to their own questions without the need for personal assistance.

- **Internet-based service and support.**

  Companies can learn how to leverage web, email and chat channels to deliver superior customer service. Many companies have also discovered that the web can be a powerful medium for enabling customers to find their own answers online. By creating sufficiently comprehensive and easy to use online knowledge bases,
companies can successfully train their customers to use their browsers to solve problems instead of picking up the phone speeding problem resolution.

- **Multi-channel integration**
  Companies have learned how important it is to integrate various channels into a single "360-degree" view of the customer. The reasons for this integration are obvious. If a customer has been e-mailing a maintenance organisation for several days about a problem and then places a call about that same problem, certainly the customer does not want to have to relay the relevant information all over again. Multi-channel integration is therefore an essential component of any customer service technology strategy.

- **Competitive pressures**
  Companies have learned they can win and keep buyers through exceptional service. In many cases, they have also learned that the service providers can actually price their products and services higher if service is competitively superior – which means the service organisation can be more profitable.

- **Customer expectations**
  Customers don’t just compare service providers with competitors. They also subconsciously compare with every other company they deal with. Every time customers encounter excellent service somewhere else, it only serves to raise their expectations even higher. Companies are therefore not only competing with other companies in their own markets, they are also in virtual competition with every other company their customers encounter. So for service to appear substandard, it
does not have to be worse than the competitors. It just has to be a little less perfect than the best company the customer has dealt with.

With so many new technologies available for improving customer service and with so many companies embracing these technologies to achieve improved business performance, sitting on the sidelines amount to corporate suicide. Customer service technologies are among the best investment any company can make.

The white paper (ibid Right now technologies, 2002) briefs about multi channel call center technology solutions that have been developed to deliver state of the art customer communications capabilities.

Key benefits of these technologies include fast, customer delighting service and support. With all the information they need about the customer and about the company’s products and services at their fingertips, Customer service representatives (CSRs) can deliver fast, accurate answers customers want and need. In addition, with better control over call routing and hold times, service desk managers can make sure customers are not already disgruntled before CSRs even start their calls.

**Cost-slashing online knowledge base automation**

Every customer interaction offers an opportunity to build the online knowledge base of questions and answers. This allows companies to quickly build their online knowledge base so that customers can help themselves 24 hours a day, seven days a week via the web.
• **Integrated voice and internet communications**

Different customers want to interact with customer service personnel in different ways at different times. Sometimes they want immediate assistance by phone. Sometimes they want to just send a quick email and hear back within a few hours. Sometimes they want to find their own answers on the company website. Technology provides this seamless blending of multiple communications channels ensuring that customers get consistent, timely answers across them all.

• **24x7 “Follow the sun” coverage**

Many companies can’t afford to staff their call centers with a second and third shift, so they can’t offer their customers 24 x 7 support. But if those same companies have offices in multiple time zones, they can use suitable technology to shift customer calls across those offices during the course of the day – extending the hours of CSR availability. Even small companies with offices in Europe and Asia have implemented this strategy to deliver 24 x 7 service.

• **360 Degree reporting**

In addition to helping companies deliver great customer service, systems also capture actionable information about current issues and problems. This information is invaluable for service managers and marketers seeking insights into customers’ needs and preferences. So customer service data can be effectively used to improve other areas of the company as well.

2.4.3 **Internet customer service solutions**

Following are some of the features of Internet customer service solutions (Jeff Honey Comb, 2001).
• **Self-service**

Self service via accurate and relevant web site content provides the fastest and most cost effective way of answering the vast majority of customer inquiries. Customers receive an immediate, accurate and meaningful answer.

The best self service is based on dynamic knowledge bases that “learn” with each customer inquiry. These knowledge bases can be initially seeded with just a few knowledge items, and then grow as customer interactions from e-mail and chat sessions are dynamically captured and published back to the knowledge base. The information is organised and ranked based on its relevancy as determined by actual customer interactions. The knowledge items are automatically managed by assigning them “half-lives” so that they get eliminated when no longer relevant.

• **E-mail management**

E-mail management provides an effective and necessary escalation path from self service for customers who prefer this form of interaction or have unique enquiries not yet captured in the knowledge base. Email can be intelligently routed to the appropriate CSR based on workloads, expertise or even customer mood. E-mail management has the capability of sending auto responses and helping service representatives search the knowledge base to find the appropriate answers. Once an enquiry is closed, responses can then be automatically published to the knowledge base, reducing similar e-mail inquiries in the future.

• **Live chat**

Live chat provides a personal, one to one level of interaction with company’s most important customers immediately. The published conclusions of live chat
sessions provide yet another customer feedback capture opportunity for the knowledge base.

- **Automated customer feedback.**

The best feedback mechanisms automatically query and tabulate customer satisfaction after every closed customer enquiry. This greatly simplifies and enhances the collection of external customer feedback while accurately measuring internal service operation performance. By closing the loop on each customer incident, the valuable feedback needed to improve operation and build customer loyalty is obtained. This is crucial because in competitive market places, loyal customers are six times more likely to purchase than merely satisfied customers.

Also important is the ability to create customisable online surveys so that the company can easily ask the customers anything under the sun. Surveys can be used to identify customer demographics, test product concepts, track brand recognition, or conduct real time polling right on company’s web site. Today’s technology allows surveys to be launched by e-mail, installed to pop up on specific web pages, or upon existing web site. Compiled results arrive instantly while eliminating the expense of traditional surveys. Ongoing, real time customer feedback enhances decision making quality and effectiveness.

**Managing and measuring tools:**

Today’s online customer service software technology provides a number of robust back office abilities. Leading edge business use a combination of the following tools to make accurate and profitable decisions.
• **Workflow management**

Workflow management as a tool, ensures customer inquiries are routed to the most appropriate agent, and enables agents to manage inquiries in the best possible manner. Workflow focuses on customer needs and allows customisable rules. Enquiries are routed based upon content, customer ranking and even customer mood. Workflow management mirrors company's best business practices which can be managed with greater organisational efficiency. This produces higher customer satisfaction at a lower cost.

• **Reporting**

Reporting tool enables administrators to make effective decisions and manage the entire customer service function. Organisation can measure everything from most common enquiries, to overall response times, to individual staff activity. Customisable options allow easy creation of reports that provide the data needed to make the most accurate and profitable decisions.

• **Hosting**

Hosting tool is a critical component of a complete, online service solution. Many companies don't have the time, expertise, or personnel needed to administer the system on their own servers. Hosting the software on a customer server enables company to deploy a complete internet customer service solution with virtually no impact on staff or technical resources. Cost savings, reliability and access to the latest scalable technology and tools are other considerations that make hosting attractive for many organisations.
Integration

Integration is the final component of the customer service framework, and it provides the linkage and connection to other applications throughout the enterprise.

Jeff Honey Comb concludes that there is a lot involved in providing impressive on line customer service. But when implemented correctly, on line customer service can be successful for any company.

2.4.4 CALL CENTER & ASSOCIATED TECHNOLOGY TOOLS

Several white papers have been published on technologies for services industry. Some of them are: Mike Evans (2001), ID 22376 (June 2000), Darin E Hartley (2001), Lisa H Harrington (2000), APQC (2000), Renaissance partners (1994). Below given are the compilations on call center and associated technologies which are taken from the above white papers:

- From call center to customer interaction center.

The challenge in the call center, which can be upgraded as the contact center or even customer interaction center, is to provide a single point of contact to customers and prospects. Companies must provide customer centered service. Integrating multiple channels of customer communication becomes critical because any customer may choose to interact through different channels at different times.

- Customer loyalty is a priority

The corporate web site and direct telephony contact are an organisation’s two greatest opportunities to build customer loyalty through good service and support.
The process of building customer loyalty begins with the first contact that a potential customer has with a company; increasingly, this is the corporate website. A good website can contain all the information necessary to resolve customer problems.

- **Enhancing the engineer's ability to service customers and prospects**

  Attending to customers' calls is one issue, growing the customer relationship is another. While communicating with the customer via e-mail, chat, or phone, the company agent has the opportunity to market maintenance proposals to the customer. In addition, prospects may use the same touch points to contact a company seeking information.

  Supporting such activities requires integration of not only the customer/prospect management and handling systems across various points of contacts but also the knowledge base of customer information and activity. During customer interaction, the ability to see a full view of the customers' history and use it for marketing purpose provides a major advantage.

- **Automating for efficiency and effectiveness**

  Traditional methods of managing customer interaction have been manual, labour-intensive processes. Company agents often have to put the customer on hold while moving among different systems to find the relevant information. Escalating or transferring service requests often results in lost or delayed requests. Once an issue is resolved, it is up to the agent to capture the knowledge gained from the transaction in the appropriate system.
Email has made it very easy for customers to request service, and companies can find themselves facing backlogs of hundreds or even thousands of e-mail messages.

Companies can use customer relationship management (CRM) applications to sort messages, route them, and capture the results of the transaction, regardless of the medium of interaction. Such applications offer not only workflow capabilities but also automation of agent processes.

- **Delivering consistent customer interactions**
  Consistent customer interactions depend on all aspects of the organisation, not just the customer relationship management application. For truly consistent customer interactions, the entire process from acquiring the customer, creating the quote, delivering the product, billing the customer, to supporting the customer is ultimately part of delivering a consistent customer interaction. In the world enabled by the internet, this is a requirement for designing processes.

- **Examining technology and solutions.**
  Implementing an integrated call center including customer relationship management function requires a number of different elements, such as hardware, PBXs and network infrastructure for managing in bound and out bound communication, middle ware for routing requests, database software for managing the customer information and finally the people who handle the requests.

  Customer support and contact center applications provide customer information management (CIM) and are designed to enhance the management of relationships.
with existing customers. Several defining characteristics of the customer support category are problem tracking, customer history, and incoming call management.

- Important organisational and technology considerations.

In evaluating any solution, companies must consider price, time to implementation, scalability, ability to integrate, solution flexibility, understanding of the company's business and in the case of outsourced services, the quality of the customer service agents.

A careful assessment of requirements is essential and must take a multidiscipline approach. Companies must ensure that their solution can evolve to handle new types of customers or new types of relationships with existing customers. Creating a truly universal view of the customer will most likely require integrating information from knowledge bases. Companies must consider and understand their data integration challenges and select solutions that can demonstrate integration capabilities, perhaps even requiring a live demo with the company's own data as part of the selection process.

Any solution that involves integrating and modifying business processes across organisational lines must be managed from the start by an integrated business and technology team. Keeping sight of consistent customer interaction across multiple channels as an overarching goal can help smooth organisational fault lines.

- Technology selection: Customer support tools

Organisations differ and the attitudes of customers vary greatly. What one customer is willing to do, another will not. So it is important to know what the customers are willing to use (Renaissance Partners, 1998).
• **Educate the customers**

Gaining acceptance of any new technology usage, require education. When considering the customer base, education is a two phase process. The first phase involves a marketing campaign to sell customers on the benefits of using the new technology. If customers don't understand and buy into the reasons for using the new technology, they will not be interested in learning how to use it.

• **Customer self help tools**

Self help tools allow customers to directly access answers to their everyday questions and decrease incoming calls to the support center by encouraging customers to help themselves. The support center maintains these tools and analyses usage for valuable information about common problems and requests. Self help tools can diagnose problems, recommend how to fix bugs, and provide technical solutions for common software and hardware questions. Self help tools also utilise a wide variety of media to offer solutions. Examples are: on line help system, electronic performance support, on line tutorials, wizards, expert systems, just in time training as well as printed manuals. Expert systems and knowledge bases that the support people use are becoming the same tool that customers can use through web or e-mail interfaces self help tools work best for customers who don't mind working with technology, and those who don't have access to the support center.

• **Remote control, diagnostics, and conferencing tools.**

Remote control packages allow the support center agent to remotely take a control of a customers' computer or conference with the end user. When this technology is employed the customer can view the problem being solved, and will often know how to resolve it themselves if the problem reoccurs. These types of tools, which
are available for most operating systems, can shorten call duration and reduce call volumes by educating the customer during the problem resolution process. Diagnostic tools allow a support center agent to test a remote client system. This reduces repair time by providing information to the people who have to go on site about the correct parts to bring to affect the repair.

Conferencing tools allow multiple people to connect together to discuss an issue. Video conferencing tools allow a remote agent to visually see what is being described and where remote control software does not work. This might be particularly important to viewing hardware or the environment.

Support center tools

Many support centers are beginning to use sophisticated tools that allow them to more efficiently manage their valuable support information.

Monitoring tools

Monitors are automated tools that test for conditions that may require intervention, observations or further testing. It will be useful to have monitoring tool that provides a support center agent with alerts or out of tolerance conditions, configuration data, driver settings, memory information and more without the customer having to call. These tools can also automate corrective actions, resulting in lower call volumes and shorter call duration.

Monitoring tools also provide a public relations benefit, because these tools are proactive. It impresses customers when they are told that the organisation know about the problem and are already working on it. More impressive is the ability to contact a customer about a problem they don't even know has occurred.
• Tracking, managing, and escalation process tools.

A call/problem management system is the core tool of customer support center. By consistently logging queries and problems, establishing links between call records and the customer database and call history repository, a call problem management system allows to efficiently manage the call resolution process. This type of system will also allow to diagnose problems and identify root causes. Analysing trends, and measuring the performance of both the support center and its customers are also possible.

This will help to create performance reports manually based on data that would be manually gathered and maintained.

With a call / problem management system, support centers have a better chance of reaching the “proactive mode”. Contacts are automatically logged, customer profiles and histories are maintained, and contacts are automatically escalated and reported to the correct groups. Electronic requests are also logged. The most proactive features that a call / problem management system provides are also the most valuable, learn from trends, and actually help avoid problems.

• Reporting tools

Reporting on call history, trends and workloads are all keys to the success of support center. A call history can be used for root cause analysis. Understanding the root cause of calls will allow to reduce the number of contacts. This understanding gives the ability to find permanent fixes. Root cause analysis may identify

-the central problem and permanent fixes
- ways to speed up solutions in the future
- necessary changes in customer training programs
- ways to distribute solutions to customers so that in the future, similar situations can be resolved without a call to the central support organisation.

Reporting on workloads can assist with staffing and service level management. Many reporting requirements can be contained within a call/problem management system. Reporting will show trends that can be used to support proposals for change. This becomes particularly important when justifying additional resource or new tools.

- Knowledge tools

There is an important distinction between information and knowledge. In many organisations there is an abundance of information. This takes the form of notes, memos, lists, problem reports and other bits and pieces of data that gets collected over time. Individuals in the support center have knowledge in their heads, as they have assimilated the information into a form they can use to resolve problems.

The most successful people in support are those who can remember who worked on a similar problem in the past or where they saw something about a particular issue. The new model for support is to systematically collect the information and turn it into knowledge by organising the data and putting it into a database in a consistent form of issue / process or symptom / solution. There are alternative approaches for organising and retrieving this information, but the net effect is a knowledge tool and knowledge base.
Knowledge tools involve two primary integrated technologies and a few peripheral technologies. The most powerful knowledge tool is an expert system. Expert systems allow to store and retrieve knowledge in a way that helps you get the information quickly and easily. By simply accessing the knowledge using either a decision tree structure (a series of yes or no answers), a rule based system (using if then paths) or a case based system (using "key word" system) a first level agent can provide answers to complex technical questions in a matter of moments. This means major savings in training time and costs.

In order for an expert system to be useful, however, it has to be filled with data called "knowledge". Knowledge consists of the actual answers to problems formatted in a manner that allows the expert system to retrieve it.

**Software distribution and management tools**

To streamline training at the support center, it is helpful to have software distribution and version control tools in place. These tools allow to distribute and install software and upgrades onto remote LANs, servers, and workstations without having to send an agent out to a location. This simplifies troubleshooting process, decreases training costs, and standardises the desktop environment. Software management tools will also help ensure compliance with license agreements.

A similar tool called asset management can maintain inventory control, costing, charge back and version control for hardware, software, networks and communication devices. Asset management tools help improve the problem
solving capability by providing current configuration information about a customers system

**Telephony tools**

The first major telephony tool is interactive voice response or IVR. IVR allows callers with touch tone phones to query computer systems, solve minor problems such as terminal and password resets, or route calls to appropriate support personnel.

A well implemented IVR system can serve as a call dispatch unit that works 24 hours a day. Many IVR units can identify customers and provide agents with “screen pops” of their history and configuration information.

The second major telephony tool is computer telephony integration or CTI. This integration of telephone and computer technologies can generally recognise and identify incoming callers. CTI reduces call time by shortening the preliminary data gathering steps. It also eliminates some agent answered calls, and increases first call resolution rate.

**Staffing and workload monitoring tools**

The most valuable and expensive resource within support center is staff. Optimising staff utilisation is of primary importance. Staffing tools can help determine the staff size required what hours of the day they are needed, how schedules should vary based on the day of the week, and what skill-sets are required during each shift. These tools also use scheduling assumptions and call history to predict service levels.
- **Second level support tools**

Second level support organisations vary widely but include such functions as hardware repair, software distribution, network management, external vendors, developers, LAN and server administrators, personnel, and purchasing.

- **Tools for secondary support organisations**

Many times support is handled by specialised groups that need to have access to the systems and procedures of the support center. These groups may be internal to the organisations or they may be external vendors. By considering these groups as extensions of the traditional support center or level one support, the organisation will be better serving their customers.

- Depot repair tracking tools keep track of depot hardware, work in progress, hardware swaps, spare parts inventories, as well as repair costs and time.

- Training/skills assessment tools offer assistance to trainers in measuring employees skills, monitoring skill development, suggesting individual training programs, and registering employees for classes to improve performance and productivity.

- Field Service Management tools track warranties, maintenance contracts, scheduled maintenance, and mean time between failures. These tools can also forecast staffing and parts requirements. In some organisations, this may include all the call management functions, as well.

- Personnel Management tools should also be considered as a secondary support tool, as they offer assistance to the Personnel department in developing
performance reviews and career planning. They also track key performance indicators.

2.5 CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

Customer Relationship Management (CRM) has its roots in relationship marketing which is based in turn on the formative work by Berry (1983), the IMP Group (Ford, 1990) and Christopher et al. (1991). Contributions to the relationship marketing debate were made by Reichheld and Sasser (1990) reporting on the customer retention work of Bain and Co. These findings indicated that a 5 per cent increase in customer retention resulted in an increase in average customer lifetime value of between 35 and 95 per cent, leading to significant improvements in company profitability (Reichheld, 1996).

The purpose of relationship marketing is to improve long run profitability by shifting from transaction based marketing, with its emphasis on winning new customers, to customer retention through effective management of customer relationships (Christopher et al. 1991).

Customer relationship management complements the relationship marketing perspective. It is defined by Couldwell (1998) as a combination of business process and technology that seeks to understand a company's customers from the perspective of who they are, what they do, and what they are like. As is the case with relationship marketing, customer relationship management focuses on customer retention (Lockard, 1998; Deighton, 1998) and relationship development (Galbreath, 1998). According to Kutner and Cripps (1997), customer relationship management is founded on four relationship-based principles:

- Customers should be managed as important assets.
- Customer profitability varies; not all customers are equally desirable.
• Customers vary in their needs, preferences, buying behaviour and price sensitivity.

• By understanding customer drivers and customer profitability, companies can tailor their offerings to maximise the overall value of their customer portfolio.

Others emphasise a technological rather than a relational perspective to customer relationship management; Peppers and Rogers (1995) claim that, 'the market place of the future is undergoing a technology driven metamorphosis.', which Kutner and Cripps (1997) encapsulate as, 'data-driven marketing'.

Notwithstanding these technological perspectives, the philosophical bases of customer relationship management are a relationship orientation, customer retention and superior customer value created through process management. Information Technology is the 'glue' that holds these together and enables the whole to be operationalised. In consequence, the successful implementation of customer relationship management requires Marketing and IT to work closely together to maximise the return on customer information. This will almost certainly require a degree of cross functional reorganisation.

In summary, the key characteristics of customer relationship management are:

• A customer relationship perspective aimed at the long term retention of selected customers.

• Gathering and integrating information on customers.

• Use of dedicated software to analyse this information, often in real time.

• Segmentation by expected customer lifetime value.

• Micro-segmentation of markets according to customers' needs and wants.
- Customer value creation through process management (Hammer and Champy, 1993; Hamel and Prahalad, 1994).
- Customer value delivery through service tailored to micro-segments, facilitated by detailed, integrated customer profiles.
- A shift in emphasis from managing product portfolios to managing portfolios of customers, necessitating, changes to working practices and sometimes to organisational structure.

In essence, customer relationship management provides management with the opportunity to implement relationship marketing on a company wide basis. However, for customer relationship management to be successful, all of these activities need to be managed in combination. What makes this possible are the recent advances in enterprise software. One company pioneering these developments, Sun Microsystems, identifies three levels of customer information technology. At the simplest level are reporting tools that link sales staff with other elements of the business. Then there is online analytical programming (OLAP) which analyses data as it comes in, enabling users to 'drill down' through levels of data to examine exceptions to purchase patterns and to understand trends and anomalies. The third level, data mining, is more sophisticated skill, and enables obscure correlations to be identified. It might, for example, reveal that sales of baby food increase if it is placed near to the beer shelves in a supermarket! (Sunday Times, 1999).

2.5.1 Committing to customer relationship management:

Organisational issues:

Management academics have been preaching customer orientation for decades, but practice has remained solidly product orientated (Levitt 1960, 1986; Drucker, 1973). However, a combination of factors has now simultaneously obliged and enabled firms to
re-organise around their customers; widespread changes in business processes, growth of the services sector, and the availability of cost-effective software solutions to the challenges of mass-customisation. Although these factors are facilitating the shift from product management to a customer focus, the shift will not be easily achieved. The necessary changes will impact on the ways that companies view their customers and how they treat them, how they are themselves organised and how they measure and reward success.

As companies attempt to re-orient themselves around customers, individual employees will have to come to terms with changing cultural norms, organisational structures and the way that their performance is measured and rewarded. Studies by Martiny (1998) and Braganza and Myers (1996) indicate that the commitment of senior management is critical to success. This was reinforced in a META Group report (1998) that singled out the Chief Executive Officer’s (CEO) involvement as a key success factor for customer relationship management projects, concluding that, 'Investing in customer relationship management technology without a customer orientated cultural mindset, inherited hierarchically throughout the enterprise from the CEO – is like throwing money into a back hole'.

2.5.2 The Marketing Perspective:

The marketing perspective on CRM hinges on its potential to offer better customer service, and to improve marketing effectiveness through better focus (McDonald and Wilson, 1999; Bessen, 1993). IT can help improve customer service in a number of areas, including reliability, efficiency, and communications as well as quality control and service monitoring (Berkley and Gupta, 1994).
Customer relationship management systems offer operational improvements (Stein and Caldwell, 1998), the opportunity to capture and analyse information about purchasing behaviour – often in real time (Hagel and Sacconaghi, 1996) and long term success through deeper and close customer relationships (Beckett-Camaratha et al., 1998). Detailed customer profiles facilitate precise matching of marketing offers to prospects (Harrison, 1993), and can be used to track the effectiveness of marketing programmes (Mann, 1990), as well as providing the basis for future planning (Shani and Chalasani, 1993). Customers also benefit when product/service offers are tailored to them individually or in micro-segments and can lead to greater loyalty (Mitchell, 1998). According to Schultz (1996), the combination of customer demands and new enabling technologies make the move to one to one marketing inevitable.

2.5.3 The IT Perspective

According to Schultz (1993), the IT perspective is that changes in customer relationship management practice are being driven both by evolving customer demand and developments in the enabling technologies. Despite this, IT managers do not always see customer development as part of their business challenge, and some are reluctant to share customer data with other departments because such information is their power-base. It is often cross-functional integration problems like this, rather than technological problems, that are the major impairment to progress (Domegan, 1996; Stone et al., 1993; Elliott, 1997).
2.6 TECHNOLOGY AND INVENTORY MANAGEMENT

Some vendors have brought out technology based solutions applicable to inventory and spares management as part of supply chain planning solutions. These solutions through the hubs and networks around the world analyse service inventory, forecast demand, generate new build orders to replenish supply and allocate materials to give the maintenance organisations’ customers the service they require. For an organisation with a wide geographical spread, technology solutions bring in information automatically from around the world on a daily basis. Where service planners used to spend days together just trying to gather the data they needed, technology solution backed system automatically collects everything into a single integrated work space on the screen. By this, hand balances and back orders, stocking levels for remote depots, demand usage history, repair stock availability, repair work in progress, spares despatch, field returned spares and vendor order positions for new buy or repair, can be obtained.

Below given are the experiences of leading IT, Telecom, communication and networking companies of US using the technology solution of one of the vendors, Xelus (www.xelus.com) of US.

2.6.1 Case study: CISCO

- Cisco experiences, in implementing technology solution for inventory management

Cisco systems is the worldwide leader in networking for the internet. Cisco’s networking solutions connect people, computing devices and computer networks, allowing people to access or transfer information without regard to differences in time, place or type of computer system. Its products include routers, switches, remote access devices, and network management software. Cisco’s customers
“simply can’t afford to be down”, says Bill Weidert, service operations manager at Cisco. “We have a high volume of two to four hour service response contracts. We need to have spare parts available throughout the world that can be accessed immediately and delivered to the customer site”.

- **Cisco's growth outpaces manual planning systems**
  This became a major challenge for Cisco as its own growth exploded. “We had a couple of service planners trying to manage an extremely fast growing business on a basic spreadsheet,” Weidert said. “It was not a scalable solution, let alone sufficiently accurate. While we were able to plan and get inventory to our central ware house, we were not able to push it out to the hubs and depots as required.”.

- **Fast implementation, fast answers**
  The technology solution brings in information automatically from around the world on a daily basis. “Where service planners used to spend days together just trying to gather the data they needed, our planners now spend zero time in collecting data”, Weidert says. “The system automatically collects everything into a single integrated workspace on the screen, on hand balances and back orders, stocking levels for remote depots, demand usage history, repair stock available, repair work in process, disbursements, actual returns from the field, and vendor order positions for new buy or repair.”

- **Enabling fast, efficient service delivery**
  “Support is 24 x 7, following the technology around the world,” says Weidert. “If the customer engineer determines that a part needs to be dispatched, they cut an
order into our database. The part is taken from one of our depots to fix the problem at the customer site”.

The technology used by Cisco system immediately recognises that a part was taken and automatically creates an allocation order to replenish it. The part is shipped and the inventory stocking level is maintained.

The system is also forecasting down the line so that we know that all this activity is occurring. What the aggregate levels should be for any particular part, says Ferdinand Gonzalez, senior service planner, “the system determines requirements at each location at a detailed level so that we can forecast ahead and incorporate the necessary lead times. It also knows the manufacturing build times and the transit times between our main warehouses, hubs and remote depots”.

- **Technology clients as partners.**

  Cisco implemented the software fast, in four months. The planners are on line at PC clients, linked internationally to the global depots across, and integrated with oracle data base applications.

  “I have been through other implementations of this kind in the past, and this by far the smoothest I have ever seen,” Weidert says, “technology has been very responsive, whatever problems we had were resolved in less than 48 hours and they always kept us informed of what was going on. This has been a great group to work with.”

  “Technology does not just treat you like a customer, its more like you are an extension of their company,” Gonzalez says, “staying on top of our growing
business is our biggest challenge, and technology has given us the ability to do that”.

2.6.2 Case Study: NCR

When NCR produced its first mechanical cash register in 1884 the company knew it would stay ahead of the competition by anticipating retail, financial and additional commercial market needs. Today NCR hardware and software enables millions of transactions a day: across the counter, by telephone, at a kiosk or ATM machine, or over the internet.

- Reducing cost while improving service

“Since implementing technology system for material management in 1997, we have taken $300 million worth of inventory out of our system”, Shaw, a senior executive of NCR says “this is a dramatic total asset reduction. In addition, we have reduced our annual purchases by $100 million per year, which has a major impact on our bottom line.” Much of that cost savings is attributable to NCR’s increased usage of repairable parts, which has increased about 30% since they began using technology solution plan.

Service levels (service delivered to the end customer) have also improved by 20% since NCR implemented technology solution plan. The number of broken calls caused by part problems has been greatly reduced and customer service engineers’ productivity has significantly increased, because now the engineers generally have the right spare part, the first time. With assistance from technology solution, NCR customer service engineers have nearly doubled their capacity to respond to service calls, now averaging five and a half calls daily instead of three.
Better service at lower costs

"With technology solution, we have enhanced service to our customers with improved service levels, preventing equipment failures and minimising down time, " Shaw said. "We have also been very pleased with our return on investment within the first year and increasingly dramatic asset reduction and yearly savings." "Over all, technology solution has created a product and a relationship with NCR that has driven us to a partnership level, " he states, "if I were looking at new solutions today, I would make the same decision to choose technology."

2.6.3 Case Study: Verizon

Verizon formed by the merger of the companies Bell Atlantic and GTE, is a global provider of high growth communication services and the leading provider of wire line and wireless communications in the United States. Verizon is also the world's largest provider of profit and online directory information. A fortune 10 company with US $64.7 billion revenues in 2000, Verizon employs more than 260,000 people in 40 countries around the world.

Facing competitive pressures from deregulation, Verizon sought ways to check escalating spare parts inventories and improve fill rates. Verizon also wanted to find an alternative to inefficient, paper based procurement methods that created a bottleneck in the service parts supply chain.

Verizon implemented the technology solution that generated significant cost savings and improved efficiencies across Verizon's entire service enterprise.

By using technology plan to optimise service parts planning, Verizon dramatically reduced service parts inventory and increased inventory turns, while reducing both scrap
and backorders. Technology solution plan provided capabilities that Verizon's previous mainframe system did not support, such as planning for parts supersession and returns.

2.6.4 Case study: SIEMENS

Siemens is a leading player in the electrical and electronic system manufacturing world. Controlling the flow of spare parts for their vast product ranges is an awesome challenge, especially where expensive items left on the shelf can quickly become obsolete.

Siemens IT services supports Siemens full range of PC, ATM banking, mainframe server and retail systems. Being ready, at all times, to maintain such a broad range of products is a challenge for those responsible for planning and forecasting the necessary spare parts inventory. The objective is to ensure that aggressive service level agreements can be met, while not overstocking with expensive parts that can quickly become obsolete.

"We were looking to reduce inventory and purchase fewer spare parts", says Martin Hedtrich, Siemens General Manager, planning "technology plan was very specific to our needs, with an ability to handle the different time series of demand, returns and effective returns forecasting." A technology solution forecasting capability was a major consideration when Siemens IT services made its choice of system. "Forecasting quality and accuracy have a huge impact on inventory levels", adds Hedtrich "we are convinced that technology forecasting methods and ways of showing the planners if the forecast is accurate will help to minimise forecasting discrepancies. Technology solution gives us a broad variety of forecasting methods and models, all specifically designed for our market".

Siemens IT services like many other complex parts providers, has set itself rigorous service levels. Siemens has established a position not only to maintain excellent service,
but also to benefit from a reduction in both inventory and excess and obsolete costs. Repair loop control, reverse logistics and item supersession are all part of the capabilities it can offer to its customers.

The new technology solution chosen by Siemens manages by exception. While most of the forecasting, planning and ordering takes place automatically, a daily work queue draws the planners attention to individual parts requiring manual intervention. This user friendliness enables planners to devote more time to addressing the real issues. Siemens was also impressed by the configuration options. Technology solution user appeal was key to the planners.

2.6.5 Case Study: Dell

Dell was founded in 1984 around a simple concept that by selling personal computer systems directly to customers, the company could best understand their needs and provide the most effective computing solutions to meet those needs. Dell’s pioneering direct model offers in person customer relationships, telephone and internet purchasing, build to order computer systems, phone and online technical support, and next day on site product services.

Dell service logistics provides the backbone of its next business day service. The group forecasts, plans and deploys items like hard drives, power supplies, key boards and cables for its customers.

"We strive for an overall customer satisfaction experience, and a big part of that is our ability to honour our warranty commitment" says Lisa Wight, business systems manager in Dell’s service logistics group. "If a customer requires service, we need to get the right part to the right place at the right time."

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The benefits they claim they got by implementing technology solution are:

- Optimizing inventory and service levels.
- Reducing obsolescence and excess inventory.
- Keeping up with change.
- Increasing use of repaired and reusable parts.
- Planning by exception improving planner productivity.
- Rapid implementations
- Very impressed with the technology solutions product

- **Keeping up with change**
  
  Technology solutions plan also helps to identify and reduce excess inventory. "Our standard warranty to our customers is three years, "Wight says. "we use technology solution plan to perform quarterly excess inventory reviews, forecast parts, and identify any excess to that forecast. This may be excess inventory that we need to work down, or we may determine that we have extended contracts with certain customers and need to maintain that inventory."

- **Increasing use of repaired and reusable parts**
  
  The technology solution plan functionality for repairs forecasting is also important to Dell. "Service level is our primary concern, and we also focus on our bottom line contribution to the profit and loss statement, "says Smith a senior manager at Dell, "because it is generally more cost effective to repair than to buy new material, the repair process and the way we manage repair inventory is crucial. Technology solution allows us to factor the yield on reusable parts into
our supply projections. This enables us to use repairable parts to compress overall lead times and reduce costs, “Smith explains.

- **Planning by exception improves planner productivity**

Technology solution plan sorts the information down loaded from a customer developed inventory management system to present Dell Planners who are each assigned specific part numbers – with a prioritised work queue of the parts that require attention.

### 2.6.6 Case Study: COMPAQ

Compaq is the world’s leading supplier of computing systems to business, home, government, and education with year 2000 revenues of $42.4 billion. Compaq designs, develops, manufactures and markets hardware and software, including enterprise computing systems, fault tolerant business critical solutions, communications products and desktop and portable PCs. Compaq products and services are sold in more than 200 countries worldwide.

Compaq wanted technology solution to extend to spare parts planning at approximately 150 field stocking locations in the United States that support same business day customer contracts as well as customer specific critical requirements. The challenge was to accurately and cost effectively stock service parts for these low volume locations to meet level of service (LOS) contracts, while avoiding excess inventory.

By implementing technology solutions, Compaq was able to increase the level of optimisation across the entire service enterprise. “Service is the highest priority for Compaq” says Alex MacRae, manager of planning systems development and control at
Compaq services GSO (Global supply operations). “it is imperative that we have the correct material positioned to support our customers requirements.”

2.6.7 Case Study: 3COM

3Com corporation is a global leader in networking and communications solutions. 3Com connectivity products and solutions for consumers and commercial organisations simplify how people connect to information and services. The company also provides access infrastructure and IP services platforms for network service providers.

3Com wanted to optimise service parts planning and forecasting across more than 200 logistics centers around the world. Their goal was to reduce inventory to the minimum levels necessary to maintain the high levels of service that 3Com customers have come to expect.

In addition to reducing inventory, the technology solution provides automated functionality and improved forecasting and planning capabilities that will enable 3Com to proactively meet service needs, prevent equipment failure and minimise downtime for customers worldwide. 3Com anticipates service level improvements of up to 70% when the technology solution is fully utilised at all its logistics centers in Asia, Latin America, Europe, Africa, and the Middle East.

2.7 KNOWLEDGE MANAGEMENT IN SERVICES

Knowledge management solutions attempt to make vast, implicit corporate knowledge as explicit as possible. Knowledge management enables companies to organise, search, use and adapt any explicit body of knowledge in response to changing customer needs, circumstances and technologies. All of this can make a huge difference in resolving the issues as follows (Service ware, October 2000):
• The ratio of call service engineers to customers can be controlled and the interaction can be made more efficient. Effective knowledge management helps engineers solve cases faster, while the self service aspects reduce the number of incoming calls. This lets the organisation leverage its service and support staff to concentrate on more complex calls and to provide faster escalation and resolution.

• Increasing call volumes can be handled via web self service. Offering customers, partners and end users of self service access to support knowledge, permits consumers of knowledge to handle many of their own queries. Additionally they get the convenience of 24 x7x365 access to information via the web. By 2005 more than 70 percent of customer service interactions for information and remote transactions will be automated as per Gartner research.

• Expertise can be shared: A knowledge management solution not only captures scarce expertise, but also makes that expertise available to all support and service engineers uniformly. Thus organisations can leverage their knowledge and make it much more broadly and consistently available to their customers, partners or end users.

• Turnover and job changes do not cripple the system: A key capability of knowledge management solutions is to capture knowledge and make it accessible to all service and support engineers. Thus knowledge no longer stays with those who hold or discover it. It becomes an organisational asset available to all who need it. This addresses two essential problems: the challenge of making the job more effective and satisfying so that key people stay with the company; and it also addresses the problem of how to keep the knowledge in the company if a key
person does leave. Therefore, it can reduce turnover and minimise the impact when it does occur.

- Training time for engineers to become productive is reduced: By training service and support engineers to effectively use a knowledge management solution they quickly become productive. Once engineers know how to use their knowledge management solutions, they become much more efficient and are ready to consistently and accurately deal with whatever customer queries may come their way.

- Identical queries can be answered from already discovered solutions. Once knowledge is captured in a knowledge management solution, it is readily accessible to all engineers. Thus once a question is researched and answered, the benefits of that work are available to anyone who needs access to that information. The result is increased productivity, allowing agents more time to deal with new queries and improve customer satisfaction.

- Information is accessible to all agents: Because knowledge captured in a knowledge management solution is accessible to all engineers, individual agents can reach the same level of expertise by building on each others experience and knowledge. High level, built in mechanisms for enterprise wide replication in knowledge management solutions enable agents in remote offices to have access to the same information as engineers in the organisation's headquarters – ensuring consistent, right answers.
2.7.1 Implementing knowledge management

On the subject of knowledge management and its implementation several white papers were published. Jerry Ryan (2000), World Bank development on Knowledge management (World bank, 1998), Tom Tobin (2001), APQC (1996,1997 & 1998), Davenport. T.H.D.W.Delong & Michael C Been (1998) are some of the papers published in this area. “Knowledge management is as much an activity as it is a type of system or technology. Thats why it is worthwhile to explore what is involved in implementing knowledge management or to put it more formally, in capturing existing knowledge within an organisation and then adapting that knowledge while capturing new knowledge going forward. Once such knowledge is captured, knowledge management professionals can apply the processes of analysis, organisation, assigning relationships and priority rankings between questions and answers” according to Jerry Ryan.

Implementing a knowledge management system within an organisation means analysing its current sources of knowledge. This includes not only capturing useful information from where ever it may exist, it also requires analysing call logs, customer e-mails, and other sources of customer interaction to learn not just what the answers are, but what questions make such answers necessary. The phases that a knowledge management effort goes through when capturing knowledge, and the activities related to completing each phase are:

Documenting knowledge: All possible sources of organisational knowledge can be analysed to build knowledge types, and to decide what attributes and values should be associated with knowledge type. Next, all possible sources to uncover existing
knowledge elements can be examined, and make it possible to discover new knowledge elements.

Sharing knowledge: Starting by recording all known knowledge elements from documents, communications and subject matter experts, interviews. Analysing the collection to classify knowledge elements by type and to establish a hierarchy or organisation among types. Finally, tagging the knowledge elements and hierarchy information to make it possible to search the knowledge base by keyword, explicit match, or relationships to one or more named problems. At each step along the way including input forms to elicit feedback from knowledge management system users about knowledge elements, element organisation, element search and retrieval and element relevancy.

Applying knowledge: This is where customers and support staff interact with the knowledge base to locate and use relevant knowledge. At this stage it is essential to refine the contents of knowledge elements and to adapt the structure of the knowledge base in response to such interaction. The ability to make and suggest useful relationships between problems and solutions is powerful enough to enlist a strong buy-in from support staff and knowledge management professionals when they see that a dynamic system can improve search results, agent productivity and customer satisfaction.

In general and within the context of customer service systems based on customer centers, knowledge management encompasses the broad range of capabilities needed to logically capture, organise, share and use knowledge elements in order to recognise problems and suggest possible solutions to customer service queries. The following functions are
crucial for a successful knowledge management implementation. Knowledge management vendors must provide solutions that are able to:

- Capture and organise knowledge elements for identification and relevance ranking. At the starting of a knowledge management system implementation, existing knowledge must be captured; and as the system is used over time, new knowledge must be added as needed, organised and ranked for relevancy.

- Applying contents of the knowledge base to incoming queries to look for matches and establish relevance between knowledge elements and query contents. The knowledge management system must make it possible to analyse the queries to look for whatever connections or relationships might exist between queries and knowledge elements.

- Maximising re-use of knowledge elements – Any relevant query is represented in a knowledge management system as it occurs, generating a knowledge element that will be considered each time a similar query occurs.

- Represent any workflow or organisational process with its own application specific sources of knowledge within the knowledge management system thus, HR professionals could have access to HR knowledge, maintenance professionals to problem/solution knowledge and so forth.

- Soliciting continuous feedback on the applicability of existing knowledge elements to new situations, new problem and new scenarios. This permits the number of element relationships to grow and explain how organisation and relevancy ranking can improve with time thereby increasing the value of the knowledge base itself.
Experience has shown that implementing a knowledge management solution is both attainable and desirable within most organisations. Within the time frames, users are able to demonstrate the success of installing, populating and using a modest knowledge base system to address service or support issues within a well defined problem area.

This initial implementation enables organisations to understand the processes and methodologies necessary to carry out a successful knowledge management project and can provide a powerful demonstration of a knowledge management systems capabilities within the user organisation. The right supplier can also provide all the necessary project management, system engineering, knowledge management, consulting, technical training and support needed to obtain the results targeted from an initial deployment.

**2.7.2 Benefits of knowledge management.**

Given the right degree of investment in knowledge management systems and technologies, and the right level of organisational commitment to their deployment, upkeep and regular use, the following benefits for knowledge management may be realised:

- Re-use of existing knowledge elements prevents recurring costs related to repeated research of the same topics, and repeated formulation of the same solutions.

- Access to in depth knowledge elements for support staff, partners and customers improves the customer service experience and speeds the time from problem statement to problem resolution.
- Support organisations can deliver faster, more accurate responses to questions. Be it from a successful self service support, or from an assisted service call, customer satisfaction improves when problems are resolved quickly.

- Faster resolution can of support calls means improved support staff productivity: Support organisations can handle more incidents particularly when self service works for common problems and queries and support staff can concentrate on helping customers with more serious problems or questions.

- As a knowledge base is used over time, continuous feedback from its users helps the system improve relevance ranking, identify new and improved solutions, and establish the applicability of known solutions to all related problems. This increases the value and usability of the knowledge in the knowledge base.

- Because knowledge management system can capture and manage knowledge from just about any subject area, organisations can use their knowledge management systems to handle problems across a broad range of topics and job functions. This permits the knowledge base to become a real repository of collective organisational wisdom.

- Because support volume can increase dramatically with little or no increases in cost for support personnel and the most needed knowledge is available online, 24x7x365 organisations that deploy knowledge management systems become much more competitive than those, which don’t. They can offer the services more often at the same price as those organisations that still rely on 8 hour or half day telephone support coverage.
• By making knowledge and customer data easily accessible, the customer service representative may even use the knowledge management tools to initiate cross sell and up sell opportunities with their customers, driving revenue, thus making the contact center a growth center and not a cost center. According to Gartner, mergers between customer service & sales, and customer service & marketing are occurring with greater frequency across enterprises in the United States. Gartner estimates that by 2007, 40 percent of call centers will have a significant impact on an enterprises revenue stream.

The proper use of a knowledge management system to support even tough calls ensures that answers based on shared knowledge come up quickly and are far more likely to be correct. The pay backs from a committed investment in knowledge management systems and technology go beyond controlling escalating support costs. They also involve an increase in customer satisfaction, the ability to capture knowledge and resolve related problems of all kinds, and an increasing ability to recognise and deal with an organisation's problems, no matter where and how they occur.

As a result, proper deployment and use of knowledge management systems and tools promise a substantial return on investment (ROI). Not only can organisations do more with the same or fewer resources, they can also deliver a better quality of service to their customers.

2.7.3 Knowledge-centered support

According to knowledge centered support brief, ver.3.0 (Customer service innovation 1999) the following points come to focuss in extending knowledge centered support.
• **Addressing the challenges:**

The service organisation's primary goal is customer productivity and satisfaction within the constraints of a shrinking budget. Whether our customers are technologists with sophisticated problems or not, the need is the same. There is an incredible demand for top-quality support delivered in a clear and efficient manner. The challenge of keeping up with advancements in technology is also discouraging. Each new product is more complex and must be integrated into an increasingly complex environment. And tough competition has narrowed profit margins all along the supply chain. The challenges have never been more intense.

Meeting the challenges of today's support environment requires more than technology. Knowledge centered support represents a shift in how we think about and manage customer service.

In order for service organisations to deliver higher value to its customers, they must focus on the source of the value: knowledge; transition from a call centric, transaction oriented model to a knowledge-centric, relationship based model.

The opportunity to learn from service interactions is huge. First because of the redundancy factor, support organisations report that 60 to 90 percent of the problems they solve have been solved before, they are reinventing answers and fixes that already exist somewhere in the organisation. There is significant time to be saved if they had access to each others experience. Secondly, the product improvements based on
continuous customer experience and feedback can drive customer loyalty and market relevance with very little wasted effort.

- **Knowledge is the by-product of experience and interaction:**

  Knowledge centered support is a methodology used to capture the experience of solving a problem and entering that experience into a collective experience base or knowledge base. This is the essence of knowledge centered support creating an organisational memory.

  For most organisations the adoption of knowledge centered support represents a transformation. It requires a shift in the organisation’s culture in terms of values and focus, as given below:

  Individual to Team
  Activity to Results
  Completion to Evolution
  Competition to Collaboration
  Content to Context
  Knowing to Learning

  The benefits of knowledge centered support, according to knowledge centered support brief, version 3.0, are:

  - solves cases faster
    
    50 – 60% improved time to resolution
    
    30 – 50% increase in first call resolution
  
  - Optimise use of resources

    70% improved time to proficiency
20 – 35% improved employee retention

20 – 40% improvement in employee satisfaction

- Enables services strategy
  50% case deflection (solved via web self-help)

- Build organisational learning
  10% call reduction due to root cause removal

20% increase in lower tier resolution

In summary, the seven points of elegance in the context of knowledge centered support are:

- **Capture in the workflow** – context and content are captured as the problem is being solved, when the support engineers/analyst hang up the phone; there is reusable solution in the knowledge base. This solution is immediately available to other agents/analysts who have similar context. There is no post call knowledge engineering on the solution (this is what drives the economics of knowledge centered support methods). Solutions are reviewed based on demand.

- **Structure** - Statements in the solutions are complete thoughts, not complete sentences. Organisation is not expecting the support staff to become technical writers. Statements are assigned to a role (problem, environment, fix). This gives the statements context and greatly improves the relevance of what people find when they interact with the knowledge base. Simple structure also adds to the usability of the solutions.
• **The process of searching is the process of creating** – As people interact with the knowledge base their search statements become the basis for a new solution, in the event they find an answer. This preserves the context (language) of the situation in the requestor’s terms.

• **Quality of the solutions (knowledge base) is managed through use** – The culture of the knowledge centered support environment is such that people take responsibility for what they see in the knowledge base. If a solution is unclear or incomplete they fix it or flag it for review. It is important to note that different players have different levels of authority in the system for visibility and update, not every one can see or update everything.

• **Solutions are migrated to new audiences based on demand** – As solutions are captured in the workflow they are made available to the peers of the person who created the solution. For example a level two analyst creates a solution, that solution is immediately visible/searchable by other level two analysts. If the solution is reused (and therefore reviewed) it would be flagged as a candidate to be made available to the level one analysts. In this way, solutions are constantly migrated closer and closer to the customer based on demand.

• **Just in time training** – The solutions in the knowledge base help speed the delivery of answers to known questions and problems as well as help analysts solve new problems faster because of the shared experience. It is just in time training v/s just in case training.
• **Wholly beneficial** – knowledge centered support does not compromise anyone, all the customers, employees and the business benefit from the knowledge centered support methodology.