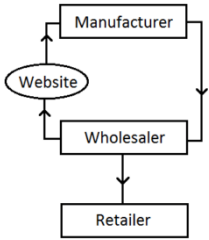


Module 1: Introduction to E-Commerce

OMMERCE: electronic commerce or EC -- is the buying and selling of goods and services, or the transmitting of funds or data, over an **electronic** network, primarily the internet. These **business** transactions occur either



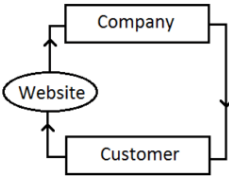
as **business-to-business**, **business-to-consumer**, consumer-to-consumer or consumer-to-**business**. EC can also be benefited from many perspective including business process, service, learning, collaborative, community.

Electronic Commerce (e-Commerce) is a term popularized by the advent of commercial services on the Internet. Internet e-Commerce is however, only one part of the overall sphere of e-Commerce. The commercial use of the Internet is perhaps typified by once-off sales to consumers. Other types of transactions use other technologies. Electronic Markets (EMs) are in use in a number of trade segments with an emphasis on search facilities and Electronic Data Interchange (EDI) is used for regular and standardized transactions between organizations. The mainstream of e-Commerce

consists of these three areas: Electronic Markets, EDI and Internet Commerce.

Types of E-Commerce:

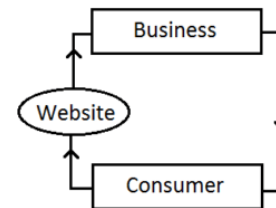
1. B2B Ecommerce: B2B e-commerce can be simply defined as the commerce between companies. In Business-to-Business type of electronic commerce system, companies do business with each other. For say, a manufacturer selling a product to a wholesaler, a wholesaler selling a product to the retailer. Here manufacturer, wholesaler and retailer all are doing their separate businesses.



The diagram illustrates the B2B model. There are 3 businesses- wholesaler, manufacturer and the retailer. Here manufacturer has a website using which wholesalers can purchase products from the manufacturer. When a wholesaler places an order on the website, the information regarding the order will be received by the manufacturer through the website. Then after processing the order, the manufacturer

will send the product to the wholesaler. After receiving the products wholesaler can sell it to the retailers. This type of business is called B2B model.

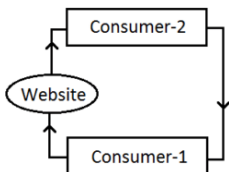
2. B2C Ecommerce: B2C model works as its name suggest. In this model, the company sells their products, goods or services directly to the consumer online. Here the customer can view products on the website that they want to buy and can order it. After receiving the order details, the company will process the order and then send the products directly to the customer. For example, **Amazon, Flipkart** etc are this type of e-commerce business model which we are using in our daily life.



We can view products on the websites like Amazon, Flipkart and can order it. After receiving the order, the selling company of the products processes it and send

it to us. Here a business company is selling their products to the customer with the help of an e-commerce website.

3. C2C Ecommerce: Here a **consumer sells products, goods or services to other consumers using the internet or the web technologies**. The C2C business model helps us to sell our assets or properties like a car, house, bike, electronics etc via online to other consumers. OLX, Quickr etc are this type of business model.



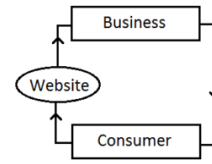
Here, if consumer-1 wants to sell a product then he/she can publish the details of the product on the website like **OLX or Quickr**. The consumer-2 can view the details of the product on that website that consumer-1 wants to sell. If consumer-2 is willing to buy the product that consumer-1 is selling, then the buyer can directly contact the seller and the product will be sold. Here products are selling directly from a consumer to

another consumer via the website.

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4. C2B Ecommerce: A consumer to the business model is a type of commerce where a **consumer or end user** provides a product or service to an organization. It is the reverse model of the B2C or business to consumer model, where businesses produce products and services for consumer consumption.

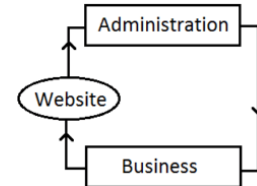
In this business model, individual customers offer to sell products or services to the companies who are prepared to purchase them. For example, if you are a software developer, then you can show a demo of your software or skills that you have on the sites like freelancer. If a company likes your software or skills then the company will directly buy the software from you or can hire you for their services.



5. B2A (also called B2G), (Business-to-Administration)

B2A or business to administration also referred as the **business to government (B2G) commerce**, it is a derivative of B2B e-commerce model. In this model, the **businesses and government agencies (administration) use central websites to exchange information and do business with each other** more efficiently than they usually can off the web.

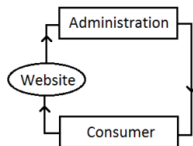
B2G business is also referred to public sector marketing that means marketing products and services to various government levels. The B2G business network provides a platform to businesses to bid on government opportunities such as auctions, tenders and application submission etc.



6. C2A (also called C2G), (Consumer-to-Administration)

Consumer to administration or consumer to government e-commerce model helps **consumers to request information or post various feedbacks regarding public sectors directly to the government authorities or administration**. For say, making electricity bill payments through the website government, making payment of taxes, payment of health insurance etc are C2A type of business model.

Consumer to administration or consumer to government e-commerce model provides an easy and instant solution or way to establish communication between the consumers and government.



E-Market is an electronic meeting place for multiple buyers and sellers providing many participants with a unified view of sets of goods and services, enabling them to transact using many different mechanisms. An e-Market uses Internet technology to connect multiple buyers and suppliers.

Electronic Data Interchange (EDI): EDI provides a standardized system for coding trade transactions so that they can be communicated directly from one computer system to another without the need for printed orders and invoices and the delays and errors implicit in paper handling. EDI is used by organizations that make a large number of regular transactions. One sector where EDI is extensively used is the large supermarket chains which use EDI for transactions with their suppliers.

Internet Commerce: Information and communications technologies can also be used to advertise and make once-off sales of a wide range of goods and services. This type of e-Commerce is typified by the commercial use of the Internet. The Internet can, for example, be used for the purchase of books that are then delivered by post or the booking of tickets that can be picked up by the clients when they arrive at the event. It is to be noted that the Internet is not the only technology used for this type of service and this is not the only use of the Internet in e-Commerce.

Scope of E-Commerce

India is developing rapidly and if development is to be measured, how can we ignore the role of e-commerce in it. The internet user base in India might still be a mere 100 million which is much less when compared to its penetration in the US or UK but it's surely expanding at an alarming rate. The number of new entrants in this sphere

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is escalating daily and with growth rate reaching its zenith it can be presumed that in years to come, customary retailers will feel the need to switch to online business.

1. Opportunity for Retailers: A retailer can save his existence by linking his business with the on-line distribution. By doing so, they can make available much additional information about various things to the consumers, meet electronic orders and be in touch with the consumers all the time. Therefore, E-Commerce is a good opportunity.

2. Opportunity for Whole Sellers/Distributor: In the world of Ecommerce the existence of the wholesalers is at the greatest risk because the producer can easily ignore them and sell their goods to the retailers and the consumers. In such a situation those wholesalers can take advantage of E-Commerce who are capable of establishing contractors with reputed producers and linking their business with the on-line.

3. Opportunity for Producers: Producers can take advantages of e-commerce by linking themselves with on-line, by giving better information about their products to the other links in the business chain and by a having a brand identity.

4. Opportunity for People: As more people are getting linked with E-commerce, the demand for centre providing internet facility or cyber cafe is also increasing. Hence, the people who wish to take advantage of it can establish cyber and have their benefits.

Hardware requirements:

Electronic Commerce and the Trade Cycle

ommerce can be applied to all, or to different phases, of the trade cycle. The trade cycle varies depending on:

- The nature of the organizations (or individuals) involved.
- The frequency of trade between the partners to the exchange.
- The nature of the goods or services being exchanged.

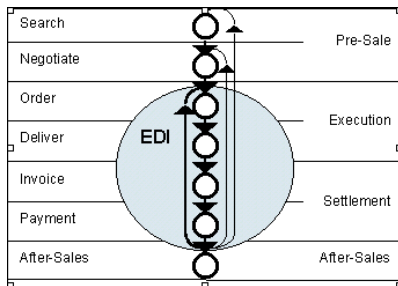


Figure 1: EDI Trade Cycle.

The trade cycle has to support

- Finding goods or services appropriate to the requirement and agreeing the terms of trade (referred to as search and negotiation).
- Placing the order, taking delivery and making payment (execution and settlement).
- After-sales activities such as warrantee, service, etc.

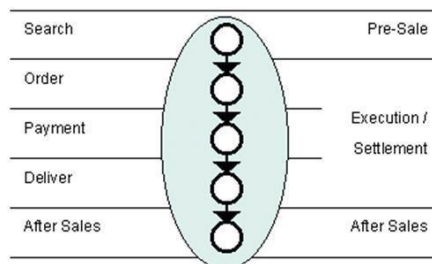
There are numerous versions of the trade cycles depending on the factors outlined above and, for many transactions, further complicated by the complexities of international trade. That said, three generic trade cycles can be identified:

- Regular, repeat transactions between commercial trading

partners (repeat trade cycle).

- Irregular transactions between commercial trading partners where execution and settlement are separated (‘credit’ transactions).
- Irregular transactions in once-off trading relationships where execution and settlement are typically combined (‘cash’ transactions).

The trade cycles for these three categories are shown. The applicability of each of the three forms of e-Commerce to these trade cycles is discussed in the following sections.



The e-Commerce Trade Cycle

Business to Business E-Commerce

Electronic Markets: An electronic market is an inter-organizational information system that provides facilities for buyers and sellers to exchange information about price and product offerings (been, et al., 1995). The electronic market is primarily about the search phase of the trade cycle. The electronic market is most effective in assisting the buyer in a commodity market where products are essentially identical across all sellers. In a differentiated market there is a variety of product offerings and the search problem is more complex. An effective electronic market increases the efficiency of the market, it reduces the search cost for the buyer and makes it more likely that the buyer will continue the search until the 'best buy' is found. The effect of an electronic market in a commodity market is a more efficient distribution of information which causes decreasing profit possibilities for sellers.

Electronic Markets (and electronic information services giving product and price data) exist in commodity exchanges, financial markets and they are also extensively used in the airline industry for passenger seat sales.

...the overall effect of this technology will be to increase the proportion of economic activity co-ordinated by markets'. The importance of electronic markets in the sectors where they operate has increased but there has not been any dramatic expansion of the use of electronic markets to additional economic sectors. Part of the difficulty of establishing new electronic markets relates to activities by vendors to gain competitive advantage by product differentiation and techniques to lock-in customers. Alternatively a public access network can be seen as an electronic market and can be used with an index or a search engine to find vendors of the required product or service. An e-Market uses Internet technology to connect multiple buyers and suppliers.

Business Roles and their challenges

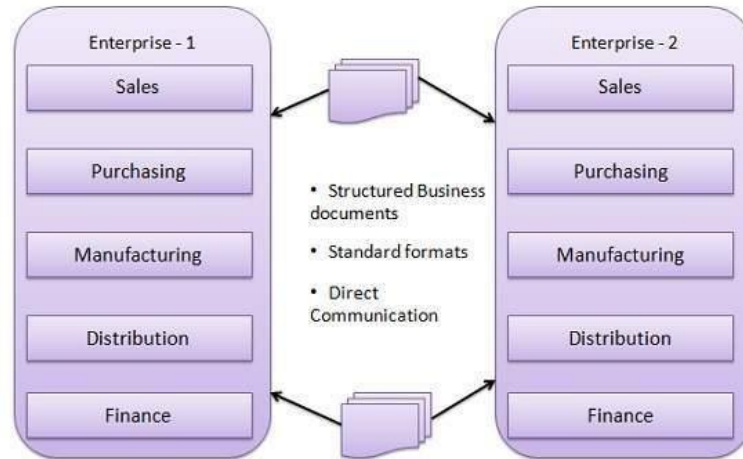
There are two main roles in the E-business scenario:

- The Buyer: Buyers are organizations that purchase goods and services directly from Suppliers.
- The Supplier: Suppliers are organizations that market and sell goods or services directly to buyers or indirectly through diverse sales channels including Web-based procurement systems and electronic marketplaces.
- Suppliers typically provide buyers with web-based services necessary for completing e-Business transactions.
- Buyers (customers) can thus review product information, receive customer service, ordering services and customization support facilities and can submit or modify orders.
- An additional role is that of Market Makers that are third party organizations that run e-markets.
- Each role has distinct business and technical challenges, but they all coalesce around a common point.
- For buyers as well as for suppliers, the primary challenge is the ability to reach a critical mass of trading partners and transaction volume to sustain their business.
- For suppliers especially, the following challenges exist:
 - Managing multiple selling channels, based on various technologies, protocols, data formats, and standard business processes.
 - Having the ability to take multiple types of orders once the customer has decided to conduct e-Business –enabled order management through the various selling channels.
 - Having the ability to differentiate and customize products and services from other suppliers, and offering them through the various selling channels.
 - Having the ability to adapt and grow the e-Business without incurring drastic technology changes, organizational restructuring.

Electronic Data Interchange (EDI): Electronic data interchange (EDI) is the most commonly used B2B e-commerce technology today. It is the computer-to-computer exchange of business documents, such as purchase orders and invoices, in a standard electronic format between business partners.

EDI is an electronic way of transferring business documents in an organization internally, between its various departments or externally with suppliers, customers, or any subsidiaries. In EDI, paper documents are replaced with electronic documents such as word documents, spreadsheets, etc.

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EDI Documents

Following are the few important documents used in EDI –

- Invoices
- Purchase orders
- Shipping Requests
- Acknowledgement
- Business Correspondence letters
- Financial information letters

Steps in an EDI System

Following are the steps in an EDI System.

- A program generates a file that contains the processed document.
- The document is converted into an agreed standard format.
- The file containing the document is sent electronically on the network.
- The trading partner receives the file.
- An acknowledgement document is generated and sent to the originating organization.

Advantages of an EDI System

Following are the advantages of having an EDI system.

Reduction in data entry errors. – Chances of errors are much less while using a computer for data entry.

Shorter processing life cycle – Orders can be processed as soon as they are entered into the system. It reduces the processing time of the transfer documents.

Electronic form of data – It is quite easy to transfer or share the data, as it is present in electronic format.

Reduction in paperwork – As a lot of paper documents are replaced with electronic documents, there is a huge reduction in paperwork.

Cost Effective – As time is saved and orders are processed very effectively, EDI proves to be highly cost effective.

Standard Means of communication – EDI enforces standards on the content of data and its format which leads to clearer communication.

Module 2: Security Issues in E-commerce

LEGAL ISSUE:

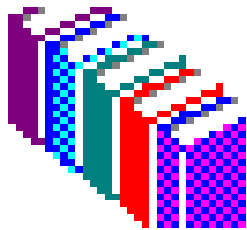
The Difference between Electronic and Paper Documents

In content, electronic documents are no different than paper documents. All sorts of documents are subject to discovery electronic or otherwise. Legally and technically, there are substantial differences between the discoveries of the two media.

-Some 93 percent of documents are now created electronically, according to industry reports. And 70 percent of documents never migrate to paper! No matter what the legal status of discovery of electronic documents will be, the prevalence of electronic documents makes them a major discovery issue.

The following is a list of discovery-related differences between electronic documents and paper ones. We assume that a paper document is a document that was created, maintained, and used on actual paper; it is not a hard copy of an electronic document.

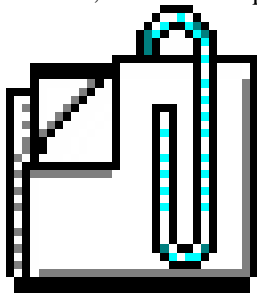
The magnitude of electronic data is way larger than paper documents



This point is obvious to the majority of observers. Today's typical disks are at several dozens gigabytes and these sizes grow constantly. A typical medium-size company will have PC's on the desks of most white-collar workers, company-related data, accounting and order information, personnel information, a potential for several databases and company servers, an email server, backup tapes, etc.

Such a company will easily have several terabytes of information. Accordingly, such a company has over 2 million documents. Just one personal hard drive can contain 1.5 million pages of data, and one corporate backup tape can contain 4 million pages of data.

Thus the magnitude of electronic data that needs to be handled in discovery is staggering. In most corporate civil lawsuits, several backup tapes, hard drives, and removable media are involved.



Variety of electronic documents is larger than paper documents

Paper documents can be ledgers, personnel files, notes, memos, letters, articles, papers, pictures, etc. This variety exists also in electronic form. But then spreadsheets are way more complex than ledger, for example. They contain formulas, may contain charts, they can serve as databases, etc. In addition to the additional information, e.g. charts, the electronic spreadsheet supports experimentation with *what-if* version the discoverer may want to investigate.

To demonstrate the variety possible in electronic documents it sufficient to consider the most ubiquitous of them: the text document. A Word document may contains:

- An active spreadsheet
- Charts
- Pictures
- Audio components
- Video clips
- Links to Web address

Proliferation of new devices such as Personal digital assistants, pocket PCs, palm devices and BlackBerry devices adds more variants of electronic documents and increases the responsibility of discovery.

Electronic documents contains attributes lacking in paper documents

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Computers maintain information about your documents, referred to as –metadata, such as: author’s name, document creation date, date of its last access, etc. A hard copy of the document does not reveal metadata, although certain metadata items may be printed. Depending on what you do with the document after opening it on your computer screen, the actions taken may change the metadata collected about that document. Paper documents were never that complex.

Text documents allow you to pick fonts, use colors, use shade selectively, use watermark and change the background and text. Spreadsheets allow one to selectively display rows and columns, hide formulae and write complex macros. Many other document types have similar and additional attributes you may employ.

Attributes such as hiding parts of the document are significant to discovery that may try to be informed about the hidden parts.

Electronic documents are more efficient than paper documents



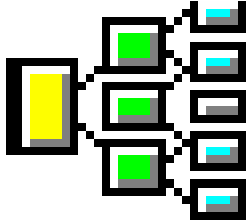
Document efficiency is not a standard term. Here, Document Efficiency means factors such as:

- Use of less space
- Easier to change
- Cost of delivery
- Faster to search

Factor	Electronic	Paper
Space	Personal file systems are physically smaller than a small cell phone	stored locally in filing cabinets ⁵
Ease of change	can be edited, copied, modified and merged with almost complete ease	requires in most cases recreating document all over again
Delivery speed and cost	by networks, disks, flash memory and CD/DVD	by mail or manually
Search/access	multiple users may access documents simultaneously	multiple users to access documents simultaneously one needs a set of documents per each accessing person

1.5 The structure of electronic documents may reach complexity absent from paper documents

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Document complexity is used quite widely in literature and industry. Recent work deals mainly with XML documents that do not directly pertain to this discussion. The presentation fits our needs. Documents complexity is the sum of *item* complexity and *format* complexity.

- Item complexity is defined as the sum of items within a complex document. An item is discrete, discernable object associated with a document. For example, the abstract, the content table page, multiple content pages, and additional items like photographs, audio and video.
- Format complexity is defined as the sum of all formats within a complex document. A unitary format document contains only one type of file encoding. A binary format document contains two types of file encoding.

There are other ways to define document complexity , but the one above approach works well for us.

Using the document complexity make abandonedly clear that electronic documents have more items and more formats and, therefore, are more complex.

Electronic documents are more persistent and more difficult to destroy than paper documents



Paper documents are easy to destroy. They may be throwing away, shredding, burned, lost or stolen. Once such acts take place the documents disappear. Deleting an electronic document eliminates only the ubiquitous accessible copy. The document, i.e. its data, still exists and in systems such as Windows and Mac OS, an accessible reference to deleted documents may be in the trash bin. Restoring a document in the trash bin, i.e. a deleted document, revives the document to its original glory.

Even removing the document from the trash bin does not erase the documents data off the disk. Once removed from the trash bin, documents data areas on the disk go into a -free list that makes those areas available for future data creation needs. The free list contains all areas not currently allocated to active documents as well as to deleted documents still in the trash bin. How long will an area stay on the free list (thereby still containing the deleted documents data)? That is difficult to predict due the huge variability of factors such as: future demand for disk space, size of current and future files, the current availability of disk space, etc.

Even the complete deletion of a document, its trash bin instance and the allocation of the document's data area on the disk does not typically extinguishes the document altogether. Certain habitual practices create copies of documents and are only marginally affected by document deletion:



- Backups – most organizations and individuals regularly create back up copies of documents as precautionary actions. The backups are maintained independently of the document itself.
- Documents may be exchanged by email, access through web pages and manually handed electronic copies. Thus copies continue to exist after the deletion of the original document.
- Even work on a simple text document is quite frequently preceded by creating a copy of the document being edited. Once again, such copies persist beyond the deleted document unless specifically deleted.

Electronic documents change faster, more frequently and easier than paper documents

Changes to an electronic document are fast and easy. The reason is obvious; all you need to do is make the change and save it. Changes to paper documents, however, require retyping the whole document.

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There are many other reasons to the difference in speed and frequency. We already said that documents may be dynamic. Web pages are made dynamic in order to ease change.

For discovery, faster and frequent changes imply a need for a more meticulous and length monitoring of document discovery.

Electronic documents last longer than

Paper deteriorates with time; paper and fire. Although these factors have their parallels in electronic documents, e.g. a flooded computer loses its data; typical maintain copies away from the office. Paper documents may enjoy the same usage of such backups is substantially lower.



paper documents

documents can be destroyed by flood. Paper documents may enjoy the same usage of such backups is substantially lower.

Electronic document suffer from upgrades in technology. If one used a peculiar word processor, e.g. WordStar, to write a document 20 years ago, today it will be difficult to convert the document to current word processor, but a tool to convert the document can be located. Same holds for spreadsheets, databases, etc. Again, most companies have practices that avoid such problems by evolving documents with time.

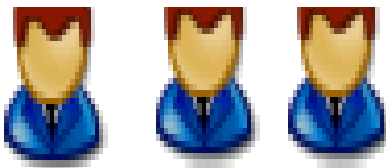
The redundancy in electronic documents is higher than in paper documents



There are several levels of redundancy to electronic documents.

- Due to the type of recording used for electronic data, minor errors in a document can be corrected by existing tools. The tools rely on the redundancy of checksums and other devices. MS Word tries to recover defective documents.
- Due to frequent changes in documents, individuals learn to save previous versions of the documents. Doing that generates redundancy of document versions.
- Emails, flash memories, CDs all proliferate documents and result in high redundancy. One copies documents to flash memory, attaches a document to an email to a fellow worker or create a CD for distribution or archiving.
- Most companies and many individuals backup documents regularly. Studies show that about 70% of enterprises meet the criteria of verifying the integrity of their backup media at least weekly.
- Tools to control versioning of files create built-in redundancy wherever they are applied. Versioning, i.e. version control, widely used by the software industry has started to infiltrate word processor as well as other applications. Versioning, by its very definition maintains *several versions*.

Electronic data is more likely to be created by several individuals than a paper document



MS Word supports Document Collaboration. Where this term implies:

new objects, properties, and methods of the Word 10.0 Object Library shown in this article allow you to change the display of revisions and comments, accept and reject revisions, and start and end a collaborative review cycle.

Another tool, Workshare 3, is an add-on to Microsoft Word that manages collaboration on Word documents and integrates this activity with email and the organization's document repository tool.

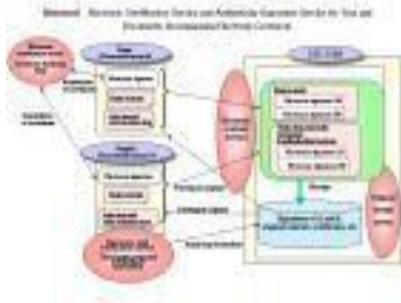
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Collaborations on databases (e.g. people using a bank's ATMs update the bank's database), spreadsheets (e.g. BadBlue), and Web sites are commonly practiced.

This dwarfs collaborations on paper documents.

For discovery it implies that the author of a Word document may not be the only person involved in writing the document. One has to determine all the parties that collaborated on the document.

1.11 Electronic documents may be created by electronic means while paper documents are created by humans



Paper documents are always written by human beings. That is not necessarily the case with electronic documents. We start with a simple, and rather common, example. The Quicken financial program can generate financial reports from a database of financial transactions.

This is an application generated document.

Category Description	7/1/2004 Actual	- Budget	3/31/2005 Difference
INCOME			
Advertising Website	0.00	0.00	0.00
Educational Activities	20,400.00	20,000.00	400.00
Interest Inc	282.41	180.00	102.41
Other Programmatic Activities	0.00	0.00	0.00
Other Revenue	0.00	0.00	0.00
Rebates	693.00	650.00	43.00
TOTAL INCOME	21,375.41	20,830.00	545.41
EXPENSES			
Admin and Oper Exp	2,782.62	2,547.00	-235.62
Advertising Expenses	0.00	0.00	0.00
Educ Act Expenses	13,625.00	13,280.00	-345.00
Other Exepnses	0.00	0.00	0.00
Other Programmatic Expenses	0.00	0.00	0.00
Scholarships	1,500.00	1,500.00	0.00
Website Related Exepnses	0.00	0.00	0.00
TOTAL EXPENSES	17,907.62	17,327.00	-580.62
OVERALL TOTAL	3,467.79	3,503.00	-35.21

Using MS Word and its Autosummarize tool on a large document we got:

Patient Monitoring Techniques in Telemedicine

E-Commerce & ERP (CS606)

Through the leverage of these devices we can formulate distributed algorithms and create effective data structures to properly monitor patients. Every patient will have very specific needs and we need a real time system to properly monitor the status of every single patient.

*Each individual patient will be uniquely identified with a combination of building, floor, room, and patient id. **Senior Citizen Patients Monitoring Tree***

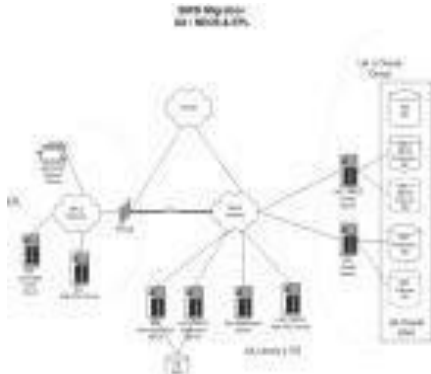
Lastly, each room contains one patient.

The objects could be customized to contain all pertinent monitoring information of each respective patient. Our goal is to formulate a Medical Object Query Language (MOQL)

*The medical devices can interface with each object api to continuously update each patient object (MP). **Research Goals***

The tool created the document within the box. In this case, discovery has to find the person that wrote the original document. That is not necessary with paper document.

Electronic discovery requires support of an infrastructure that paper discovery has never needed



The large volumes of data, its complexity, its variety of electronic documents have brought about many types of computer tools to help overcome the obvious difficulties.

Socha Consulting provides the following entries in its Tools section (we drop the commercial part and use just the generic description):

- Electronic discovery software; allows users to evaluate and manage electronic documents
- Automated litigation support software; allows users to organize, search, and retrieve e-mail with attachments
- Open, view, print and convert various file types
- Review, acquire and analyze digital information on individual machines or across a wide-area-network
- View and access contents of various file types
- Automated litigation support software; allows users to process electronic files

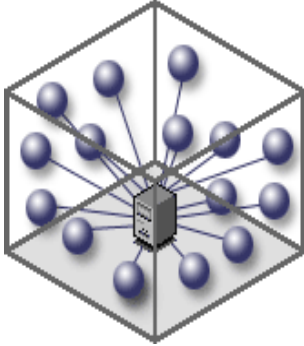
1.13 Electronic documents are searchable while paper document must be read



Electronic documents benefit from a large variety of search tools. Search goes through far more documents than human beings could review manually. Different techniques provide a rich set of options starting from keyword search, proximity search and semantic searches. For discovery, this search potential end up producing results.

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Electronic Document are Environment Dependent more than paper documents



-Electronic data, unlike paper data, may be incomprehensible when separated from its environment. The critical question is what is meant by environment. The report of the Sedona Conference takes environment to be the actual software structures used by the document. They say: -[i]f the raw data (without the underlying structure) in a database is produced, it will appear as merely a long list of undefined numbers. To make sense of the data, a viewer needs the context that includes labels, columns, report formats, and other information. Actually, given just the numbers from a paper ledger without the labels and tags is quite meaningless as well.

Environment as in the folder in which a document resides can potentially influence the document content. Some documents are made Lego style. That is, the master document consists of independent sections, i.e. small identifiable documents that are brought together by linking. (Web pages tend to be thus constructed.) Once the master document moves to another folder, the links, or some links, may be severed resulting in a different document than intended.

Software serves as a good example for environmental dependency of documents. Paths, Include files and their location, location of executable files are involved in developing and testing programs. If any one of the elements is misplaced or wrong modified, the development process suffers.

Legacy Electronic documents may be more difficult to discover than Paper Documents



Above, we mentioned text documents written with WordStar. Although organizations undergo migrations of applications, platforms, methodologies and practices quite often, today's technological mind set mandates keeping electronic resources up to date or ascertaining that tools to convert these resources from their old form to the new form are readily available.

The danger to discovery due to migration is limited and typically solvable. For instance, although WordStar documents may be 20 years old, the marketplace provides tools to convert the document into the latest MS Word version. After all, one can easily locate spare parts for a 60s Beetle.

Discovery does face difficulties due to old technology, but this stems mainly from legacy systems. Large organizations or companies with huge investments in information technology found it too difficult to move on to newer technologies. Thirty year old computer systems, though clearly archaic in technological terms, are not uncommon. Discovery may have a handful with such systems. Expert may be difficult to find, discovery tools do not work on the legacy systems and, sometime almost unbelievable yet true, even the owning organization does not really know much about their system (all they know is input and output). At the very least, discovery will be expensive.



Electronic documents tends to make assessing them more difficult than paper documents

A claim is made that the ease and flexibility with which electronic documents are created, copied, moved and managed tends to result in too many copies of the document or pieces thereof. When one contrast that reality to paper documents, without that ease and almost costless space resources, it seems like moving from a disheveled office to one neatly organized. Obviously, the mess is -not good for discovery.

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Clearly, this is a potential problem; we do not have research results that help us know whether it is a problem or just an annoyance. Multiplicity and disorder in document management is not the only price an easy to use technology extracts. Following is a list of difficulties we tend to encounter:

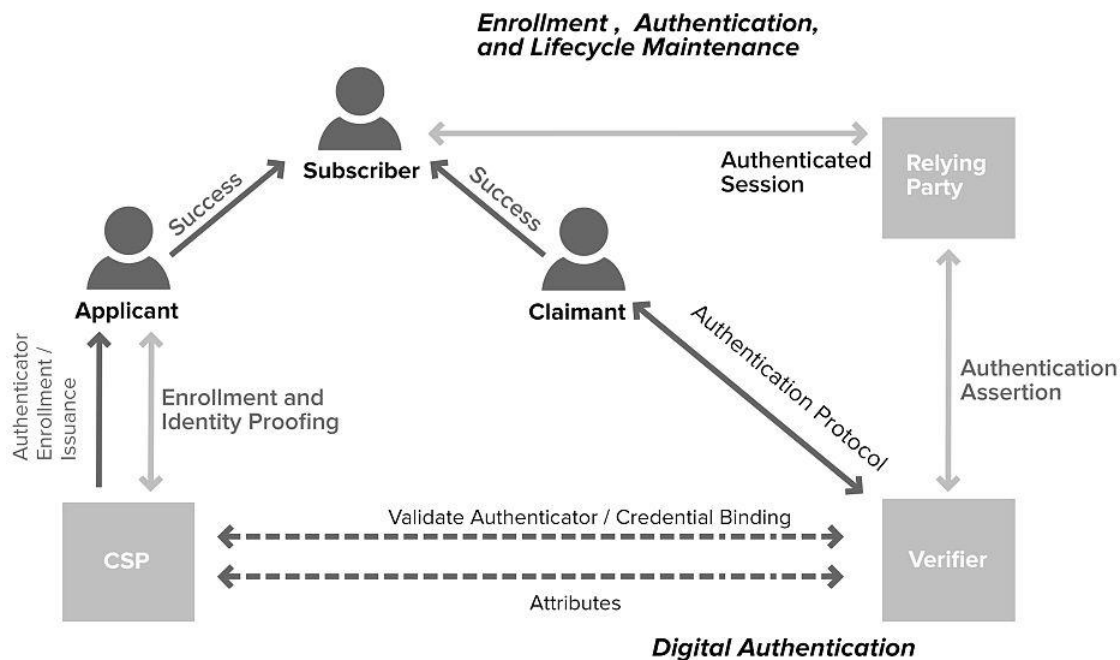
- Use of sophisticated document features backfires. For instance, word processors support use of macros. (A macro is a series of commands that is recorded so it can be executed later.) An uncontrolled use of macros may yield unhealthy, shaky and difficult to use documents.
- Documents may be part of a set of document where the set has functional significance. Moving a file away, i.e. deleting the document from the set, may damage the set. For instance, a software product may come with a: installation guide, user guide, reference guide and a demo scenario. Removing one of these documents may make the product difficult to use.
- Sets of documents may have their members spread over a network of servers in diverse geographical locations. A change in one of the locations may spell trouble.
- Collaboration in document production and maintenance is typically encouraged. Yet, collaboration has obvious pitfalls. Coordination, agreement, accountability and scheduling are all supporting productivity and source of complication

The sky doesn't get darker and electronic documents are not going to be replaced by paper documents in the foreseeable future. Cars kill more people than horses and buggy. We learned to enjoy the car and never compare it to old animal technology. In summary, it's a problem but not a major one.

In the chapter dedicated to ED tools, we will discuss tools in a generic way and demonstrate their functionality.

AUTHENTICATION OF ELECTRONIC DOCUMENT:

Electronic authentication is the process of establishing confidence in user identities **electronically** presented to an information system. Digital **authentication** or **e-authentication** may be used synonymously when referring to the **authentication** process that confirms or certifies a person's identity and works



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LAWS AND LEGAL ISSUES FOR INTERNET COMMERCE:

Trademark:

Trademarks are names or marks that are associated with your products and services. While trademark rights are acquired by use, registering your trademark with the Canadian Intellectual Property Office (www.cipo.gc.ca) will enhance your rights. A trademark is typically a name, word, phrase, logo, symbol, design, image, or a combination of these. Keep in mind that website content can infringe on trademark rights. The similarity of the marks and the similarity of the goods or services are important factors in assessing infringement of trademark rights. If you have a unique name for your business or product you should seek advice from an experienced trademark lawyer. Internet trademark use that is awful in the website owner's jurisdiction may infringe trademark rights in other jurisdictions. Canadian courts have tended to apply jurisdiction over foreign owners of websites only in cases where the foreign owned websites are used to communicate and conduct commerce with Canadian residents.

The following are some measures that may be taken to protect trademarks on the Internet

- Has the Internet been searched for the trademark you intend to use? It is wise to conduct this search before registering and using domain names.
- Have you considered using and registering your domain name as a trademark? This will help you support a claim of trademark rights if someone challenges your use of a particular trademark. Registrations should be made in as many common domains as possible (e.g. .com, .ca, .org, .net)
- Have you declared your trademark right on your websites? Have you declared your trademark rights in website use agreements? If you are using another business/person's trademark, is it authorized by a trademark license? Similarly you should not allow others to use your trademark without a trademark license.
- Have you registered your domain names with local registrars? This will reduce the risk for infringing foreign trademarks.
- Do you (or your service provider) regularly search the Internet for unauthorized use of your domain name?

DOMAIN NAME:

Domain Names Domain names are the addresses of sites on the Internet. They can include key trademarks and can be valuable assets in terms of branding your business or product. The registration and use of website domain names are subject to trademark laws. You can opt to register your domain name as a trademark. Consult a lawyer if you think you might be infringing on another company's trademark. Your domain name should not include the name of another company or product.

Domain names should be carefully selected so that you do not violate the trademark of another business. You can opt to have a web host select and register your domain name. If you wish to register a .ca domain name, you must do so through an accredited registrar. You can go to a domain registration site to check if your selected domain names are taken and also to register your domain name. Examples of accredited registrars where you can register a .ca domain name include:

- The Canadian Internet Registration Authority – www.cira.ca
- Internic.ca – www.InternIC.ca

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- ICANN – www.icann.org You may wish to choose to buy more than one domain name to protect your brand and encourage more Internet users to visit your website (for example, you could use two domain names – one ending in .ca and the other ending in .com).

COPY RIGHT:

Copyright is the right to make a copy and applies to pictures and written materials on your website. It can also relate to computer codes used to create computer programs. In Canada, people who create original works automatically have copyright protection over their work. The new Copyright Modernization Act came into effect in November 2012, bringing changes to Canada's copyright laws to adapt them to the digital economy. The new act provides stronger provisions to protect the rights of creators, while at the same time legalizing a number of common activities for users. It is important to recognize, however, that many of the new user-oriented provisions are meant for non-commercial purposes. Below are some of the key provisions of the act:

- Users have greater freedom to include copyrighted content into their own works, as long as it is not for commercial gain and does not affect the artist's reputation or his/or her market.
- Users may include copyrighted content in their own products and activities if it pertains to the areas of education, satire or parody.
- Users can make back-up copies of material as long as they are not protected by a digital lock or part of an on-demand service.
- Users are prohibited from breaking digital locks, the technological measures that copyright holders have implemented to prevent users from copying the material. Service providers are prohibited from offering services over the internet that will assist in the violation of copyright laws.

JURIDICTION:

Jurisdiction means the right and the official power to interpret and apply the law. Each court is responsible for certain suits. There are geographical limits wherein legal authority can be exercised. The jurisdiction is a condition for the verdict: That means that only if the jurisdiction is given, the court is able to deliver the verdict .

Development of Trade

Through the internet and the e-commerce cross-border trade is quite easy and the number of international legal transactions is increasing. Legally responsible persons are contracting with other persons all over the world. So, for example, it's possible, that a company in Spain, with a server in the USA, sells its products to a customer in Germany. In this situation, when different nations are involved, the question arises which jurisdiction is responsible for the suits.

International Jurisdiction

Traditionally in Germany¹⁾ the jurisdiction is given for legally responsible natural persons and corporate bodies who are acting in the country and for legal transactions and events that occur within the borders of the nation (territorial principle). So jurisdiction is often based on geographical connecting factors, such as the domicile of the parties. Other connecting factors are for example the place of contracting or the place of performance.

The German civil process order (ZPO) doesn't contain a general provision for the international jurisdiction. As a basic rule the German courts are cognizant if they have the jurisdiction *ratione loci*.

Within the European Union (–EU) exists a special rule, the –Council Regulation (EC) No 44/2001 of 22 December 2000 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters¹, entered

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into force on March 1st, 2002 (hereinafter the Regulation). Within the limits of the Regulation , it has priority over the national rules. To emphasize are the special provisions for consumers.

PRINCIPLES OF LIABILITY OF INTERNET SERVICE PROVIDERS:

The liability of information service providers, such as internet service providers (ISPs), is a complex issue that must often be resolved under the law and jurisdiction of several countries. It is therefore necessary to analyze public and private international law.

The issue of ISP liability is frequently placed exclusively in the context of the publication of obscene or racist content. However, this narrow vision of informative liability (which subsumes the liability of information service providers) should be broadened.

Framing the Topic

Types of liability

There are several types of ISP liability. A classic division differentiates contractual liability from extra-contractual liability, which is based on the principles of law.

The following types of informative non-contractual liability depend on the type of right infringed:

- liability arising from the infringement of registered personal rights (eg, patents and trademarks);
- liability arising from the infringement of personal rights that do not need to be registered (eg, copyright and trade names);
- liability arising from the infringement of inalienable personal rights (eg, the right to one's name, honour, image and privacy); and
- liability arising from the violation of the rights of communities (eg, incitement to commit a crime or misdemeanor or incitement to armed revolt).

The following types of informative non-contractual liability depend on the type of regulation infringed:

- criminal liability
- civil liability
- liability arising under regulations for the protection of consumers or competition
- liability arising under regulations for the protection of the rights of minors (eg, laws against child pornography); and
- other liabilities (eg, liability arising from the infringement of the right to family privacy or the inviolability of correspondence).

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Legal framework

All countries possess a criminal, civil and administrative legal framework - some more extended and developed than others - which regulates this wide range of liabilities within the country's territory.

The provisions of national law that regulate informative liability usually concur in condemning fundamental crimes and differ only with regard to punctual issues. For example, slander, deceitful conduct and child pornography are condemned worldwide, whereas Nazi and anti-Semitic propaganda is not always prohibited.

The main difference lies in the way in which countries penalize or determine responsibilities for the infringement of regulations. Fines, prison sentences and the amount of compensation differ substantially from one country to another.

There are a great number of regulations on informative liability at national level. On the other hand, very few agreements deal with this issue on an international level - even though there are some honorable exceptions, such as the EU E-Commerce Directive (2000/31/EC).

With the advent of the information and communications technology era, pressure groups have sought to avoid the application of national regulations to the Internet. According to these groups, cyberspace should not be regulated by law. However, the Internet plays a significant part in today's world; it should thus be subject to rights and obligations in accordance with the law.

Substantive Principles of Informative Liability

Freedom of information

The governing principle of liability is freedom. Without freedom, there is no freedom of choice; without freedom of choice, no one can be held liable for his or her acts. On the other hand, freedom cannot exist without liability, as everyone must answer for his or her acts.

The fundamental right to information (which is recognized in several international agreements and constitutions) involves the ability to search for, diffuse and receive information. The authorities must not interfere with the free circulation of information. Therefore, in most cases prior censorship is prohibited. Article 4 of the directive (principle excluding prior authorization) is a corollary of that principle.

Ex post liability

The right to information does not imply the irresponsibility or impunity of the media. *Ex post* liability arises after the diffusion of the information.

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In some exceptional cases - which must be interpreted restrictively - it is possible to prohibit the diffusion of certain content (eg, copies made without the authorization of the copyright holder) or the creation of certain content (eg, the making of paedophile films).

Principle of 'liable controller'

It is generally difficult to determine liabilities in the context of the provision of information. The key to resolve this issue is to admit that someone must be liable. The diffusion of information presupposes the principle of freedom of the informer - and, as a consequence, the informer's liability.

According to the general theory of liability, anyone who participated in a crime (authors, accomplices and accessories after the fact) may be held liable for it. The functioning of communication enterprises (including ISPs) usually relies on numerous employees (eg, photographers, reporters, salespeople and editors). All employees participate in some way in the publication or diffusion of the information; however, it would be unfair to hold them all responsible for an offence. Therefore, information law limits liability principally (and sometimes solely) to the person(s) directly involved in the infraction or damage.

Previously, the authors, accomplices and accessories after the fact could be held liable for a crime. For example, in the case of a slanderous political wall poster, the author, editor, publisher and owner of the advertising wall, among others, could be held liable. This regime of liability may have been justified by the fact that, in the past, a newspaper was produced, written and sold by only a few persons. This argument has now become out of date. The dimensions of communication enterprises (including ISPs) are such that it would be unfair - even impossible - to apply the former regime. For example, in the case of a slanderous television programme, it is more convenient to hold only one person liable (even though the cameraman filmed the offending scene, the editor failed to cut it, the media director failed to cancel the programme and the ISP failed to avoid diffusion on the Internet).

Various regimes of informative liability have existed in the past, including:

- liability by substitution;
- the 'liable manager' regime;
- the 'liable editor' regime; and
- cascade liability (the most widespread system within the written press), which was created two centuries ago by Belgian law - only one person is presumed to be liable unless he or she can demonstrate that someone else was more directly involved in the offence.

With regard to ISP liability, the 'liable editor' regime first imposed itself. However, ISPs are now increasingly considered as mere distributors or libraries. Current technology does not allow ISPs to effectively control the

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volume of information introduced by its users. Moreover, the information cannot be controlled effectively without incurring disproportionate expenses.

The principle of 'liable controller' refers to the effective control of the information. If an ISP has the technical capacity to control the information effectively and uses this capacity, it can be held liable.

Some ISPs save third parties' data automatically. They possess the technical capacity to control this data, but consider that it is not their function to do so. If ISPs have an 'effective knowledge' (in contrast to the mere automatic reception of the data) that certain information is illicit, they have a duty to inform the relevant authorities and withdraw the data (or make it inaccessible). If an ISP fails to report an offence, it becomes accessory after the fact; if it fails to withdraw the information, it becomes an accomplice to the infringement. The ISP's capacity to control information and its effective knowledge of the offence determine its obligations.

Principle of authenticity

ISPs and the information that they provide are subject to the principle of authenticity.[\(5\)](#)

Subjective authenticity implies that ISPs must identify themselves to their interlocutors. The principle of authenticity of the content is applicable to data messages. This principle is widely applied in several fields, including:

- commercial propaganda;
- non-requested commercial mail (which must identify the sender); and
- ideological information (the transmitter must admit its convictions).

The issue of authenticity is dealt with by national and international law, as well as in codes of ethics.

Principle of auto-regulation

The legislature aims to make information on the Internet (and in any medium) free, objective and truthful, but there is a limit to its powers. From that point, professionals must auto-regulate their activities. The legislature has thus established codes of ethics for professional associations. The law may oblige professionals to subscribe to these codes, but it cannot enforce its contents.

Adjective Principles of Informative Liability

Principle of state sovereignty

Many countries (mainly developing countries) have renounced their state sovereignty in this field because of the global dimension of the Internet and the significant technical, legal and economic hurdles faced in determining the liability of ISPs and enforcing penalties.

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However, countries still have sovereignty to regulate, prohibit and penalize, among other things, false propaganda, deceitful advertising, trademark and copyright infringement and child pornography. Governments must enforce the principle of sovereignty over the information circulating within their territory, irrespective of its origin or source.

Principle of state liability

It is the *raison d'être* of the state (as established in several constitutions) to guarantee and protect fundamental human rights, including the right to information. The state is the custodian of these rights. State authorities or the state itself may be held liable for infringement of these fundamental rights.

Determination of the applicable law

Information may have its origin in country A and be received in country B, where an information provider multiplies its target. The message is then diffused in countries C, D and E, where it is posted on a webpage, which is accessible worldwide. Under which law should the liability of the information provider be assessed? In which jurisdiction should litigation take place?

In order to answer these questions, the following elements should be taken into consideration:

- Consumers have a right to assert claims in their own country and under the laws of their country. Claimants need only demonstrate the existence of a connection with this country for the national laws to be applicable. Therefore, liability for services provided in a certain country is limited by the legal system of that country. If services were provided in several countries, the laws of each of these countries would be applicable.
- Liability is usually governed by the law of the country where the unlawful act took place. With regards to civil crimes and unintentional tort, the obligations arising from crimes or misdemeanors are subject to the same law as that applicable to the crime or misdemeanors in question. However, certain crimes are judged under the *lex fori*. Therefore, the law of the country where the regulation was violated applies to, among other things, the diffusion of content that is inappropriate for minors without any warning. It is nevertheless necessary to establish a sufficient connection with the country.
- Specific obligations required by law (eg, the obligation to make certain information available to the public) are governed by the law that set them forth. Accessory obligations are governed by the law that regulates the main obligations.
- With regard to criminal matters (eg, child pornography, diffusion of racist content and incitement to commit crimes, which is a criminal offence in certain countries), the general rule is the principle of

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territoriality. No state shall apply the criminal laws of other states within its territory. Where crimes have been committed in several countries, every country has jurisdiction to judge the crime under the Sánchez de Bustamante Code. In contrast, under the Montevideo Treaty, proceedings should be held only in the country where they were first initiated. However, where the crimes are related, the treaty grants jurisdiction to the country in which the most serious crime has been committed.

- IP rights that must be registered in order to be exercised (eg, patents and trademarks) are governed, in principle, by the law of the country where registration took place. Nevertheless, numerous national and international regulations grant additional protection.
- The right to fair competition, which is based on the universal principle of good faith, is applicable worldwide in numerous sectors (eg, registered and unregistered trademarks), although certain countries do not have the capacity to enforce this right.
- Several treaties acknowledge the existence of fundamental rights. These rights may be invoked in national and international courts.

INTERNET CONTRACT ENFORCEABLE:

In our practice, we frequently receive questions about the enforceability of so-called "Internet contracts" - agreements reached between parties over the Internet. Generally speaking, an analysis of the enforceability of any contract is the same, whether the contract was formed by the parties over the Internet or by the execution of a written document.

Though the Internet is fairly new, the enforceability of Internet contracts is governed by the well-established legal principles which apply to traditional written contracts. To form an enforceable contract, two or more parties must mutually assent to the terms of the contract and the contract itself must be supported by some consideration. Internet contracts generally fall into one of three categories, with each one being treated slightly differently by the courts.

Shrink-wrap Agreements

Shrink-wrap agreements are named for the license agreements contained in the packaging of commercial software products. Online, these contracts provide notice that continued use of the site will constitute the user's agreement to the site's terms and conditions. Generally, courts hold that these agreements are enforceable, if proper notice is provided to the website user. On the other hand, courts will not permit one party to unilaterally impose contract terms or amended terms without proper notice to, and agreement by, the other party.

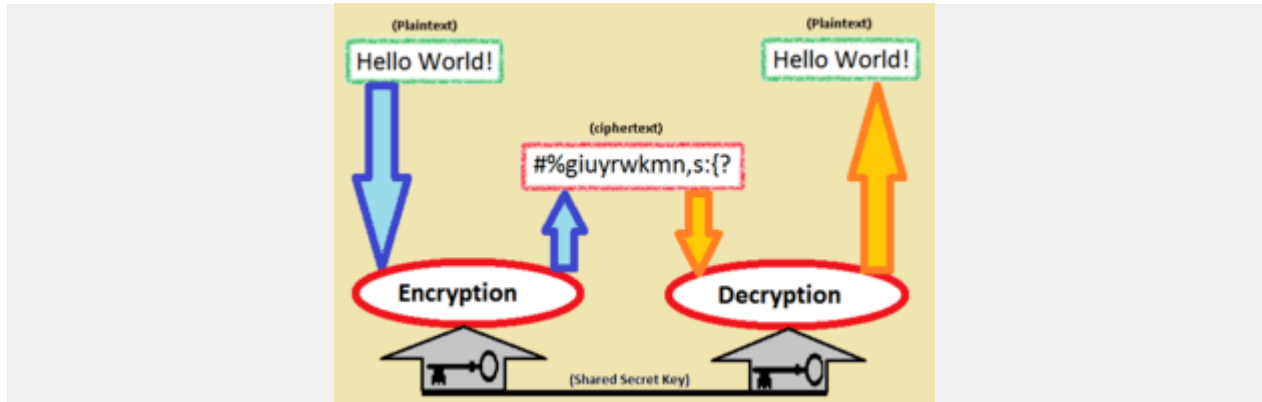
Click-wrap Agreements

Often, the user of a commercial website is asked to read a set of terms and conditions governing the activities and then asked to agree to those terms and conditions before making a purchase or obtaining the service offered by the website. Agreements entered into in this fashion are referred to as "click-wrap" agreements because the user typically indicates his or her agreement to the terms and conditions by clicking a button or hyperlink marked "I agree." Such contracts are generally binding, subject to traditional contract law principles.

Browse-wrap Agreements

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the client only, then it is required to transmit to the server. In this case, a special concern is provided while transmitting this session key over a network. Because, if the key would get into the wrong hands, s/he can see all your transmitting information with any possible intention.



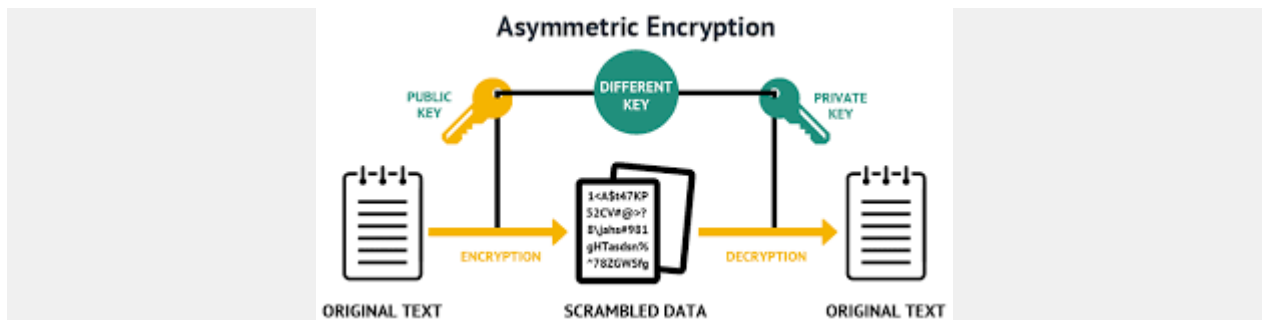
Symmetric Encryption

Modern approaches of symmetric encryption are executed using algorithms such as DES, QUAD, Blowfish, AES, 3DES, RC4 etc.

This type of encryption is used, when we are interested in transmission speed such as in transferring large files.

Asymmetric Encryption:-

It is also known as public key encryption or public key cryptography. Here, a pair of keys is used for encryption and decryption. These are the public key and the private key. The public key is used for encryption and the private key is used for decryption. Here, the private key is kept a secret to the owner and the public key is kept with all the servers to whom this client wants to connect.



Asymmetric Encryption

Understanding asymmetric encryption with workflow.

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Suppose, a client wants to send a signal to a server. It will encrypt this signal using “**server’s public key**” and will transmit over the network. When server will receive this signal, it will decrypt this, using “**server’s own private key**”.

The same is followed by a signal coming from the server. The server will encrypt the signal using “**client’s public key**” and the client will decrypt this, using “**client’s own private key**”.

In this way, 2 keys equally participate in the process of public key cryptography. Due to the involvement of 2 keys, it is slower and more complex than symmetric encryption. Diffie-Hellman and RSA are the most widely used algorithms for asymmetric encryption.

Key differences between symmetric and asymmetric encryption:-

1. Symmetric encryption involves only one key e.i session key. While asymmetric encryption uses two keys e.i public and private key.
2. Symmetric encryption is faster and simpler than asymmetric encryption.
3. Symmetric encryption is preferable over asymmetric encryption when a large file transfer is concerned.
4. Asymmetric encryption is used to share the session key using which, symmetric encryption can be initiated.
5. Asymmetric encryption is newer than symmetric encryption.
6. In case of asymmetric encryption, no secret channel is necessary for the exchange of the public key.

RSA Encryption

How does Public-Key encryption work?

Let's assume we have two parties, Bob and Alice, who wish to transmit confidential information to one another over the Internet. Alice would like to send Bob a corporate document using a Public Key encryption system. To accomplish a secure transmission, they will need to do the following :-

- Alice and Bob agree on a public-key cryptosystem.
- Bob generates a pair of mathematically linked keys : one public, one private.
- Bob transmits his public key to Alice over any insecure medium.

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- Bob keeps the private key a secret.
- Alice uses Bob's public key and the encryption algorithm to encrypt her message, creating a ciphertext.
- Alice transmits the ciphertext to Bob.
- Bob decrypts the ciphertext using the same algorithm and his private key. The RSA cryptosystem is based on modular exponentiation modulo the product of 2 large primes. Each individual has an encrypting key consisting of a modulus $n = pq$, where p & q are large primes, say with 200 digits each, and an exponent e that is relatively prime to $(p-1)(q-1)$. To produce a usable key, 2 large primes must be found (this can be done quickly on a computer using probabilistic primality tests). However the product of these primes $n = pq$, with approximately 400 digits, cannot be factored in a reasonable length of time.

RSA Encryption

In the RSA encryption method, messages are translated into sequences of integers. This can be done by translating each letter into an integer, as is done with the Caesar cipher. These integers are grouped together to form larger integers, each representing a block of letters. The encryption proceeds by transforming the integer M , representing the plaintext (the original message) to an integer C , representing the ciphertext (the encrypted message) using the function. $C = M^e \text{ mod } n$ Below I'll show you an example of using RSA encryption, for practical reasons I've used small primes p and q , rather than primes with 100 or more digits. Obviously this cipher ISN'T secure. We select 2 primes, $p = 43$ & $q = 59$ so that $n = 43 \cdot 59 = 2537$, and with $e = 13$. $\text{gcd}(e, (p-1)(q-1)) = \text{gcd}(13, 42 \cdot 58) = 1$ ($\text{gcd} =$ greatest common divisor) Lets take the hypothetical message STOP, first we'll convert the letters into their numerical equivalents (position in the alphabet-1) and then group those numbers into blocks of 4. 1819 1415 = ST OP We encrypt each block using the mapping: $C = M^{13} \text{ mod } 2537$ Computations using modular multiplication show that $1819^{13} \text{ mod } 2537 = 2081$, and $1415^{13} \text{ mod } 2537 = 2182$. The encrypted message is thus 2081 2182.

RSA Decryption

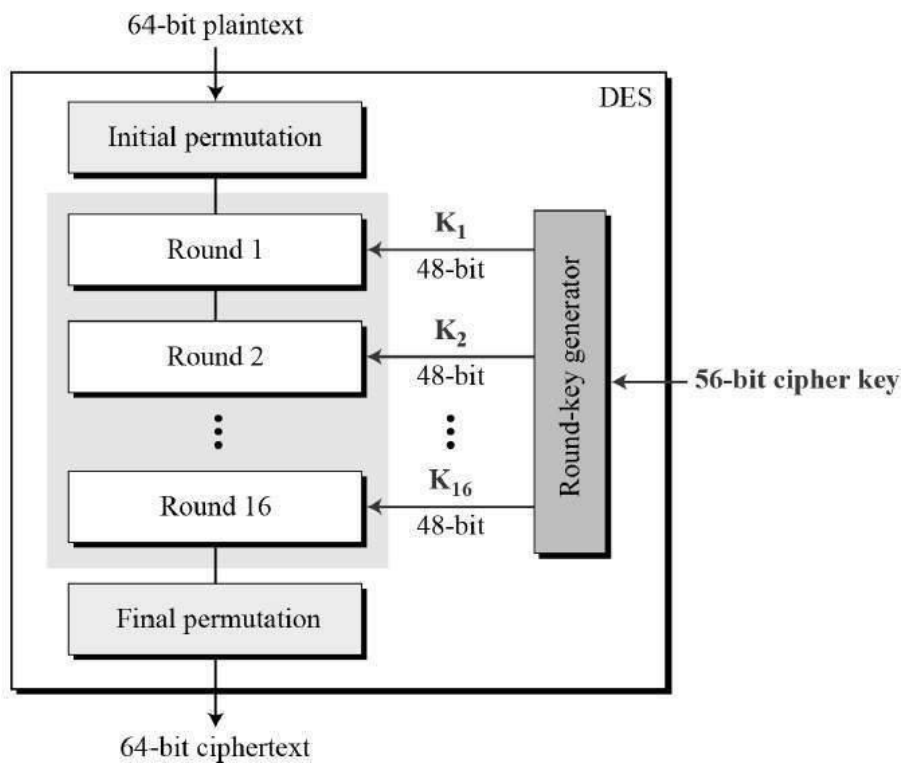
The plaintext message can be quickly recovered when the decryption key d , an inverse of e modulo $(p-1)(q-1)$ is known. (Such an inverse exists since $\text{gcd}(e, (p-1)(q-1))=1$). Using the simple cipher above we receive the message 0981 0461, lets go about decrypting it. $n = 43 \cdot 59$ and e (exponent) = 13, we can work out that $d = 937$

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is an inverse of 13 modulo $42 \cdot 58 = 2436$. We therefore use 937 as our decryption exponent, therefore $e \cdot P = C^{937} \bmod 2537$. Using fast modular exponentiation (an algorithm) we compute $0981937 \bmod 2537 = 0704$ and $0461937 \bmod 2537 = 1115$. Quick translation reveals that this message was HELP.

DES

DES is an implementation of a Feistel Cipher. It uses 16 round Feistel structure. The block size is 64-bit. Though, key length is 64-bit, DES has an effective key length of 56 bits, since 8 of the 64 bits of the key are not used by the encryption algorithm (function as check bits only). General Structure of DES is depicted in the following illustration –



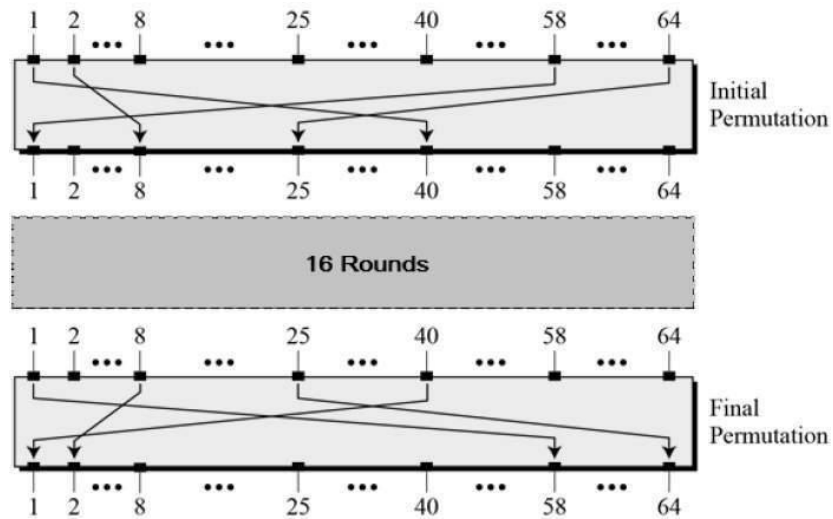
Since DES is based on the Feistel Cipher, all that is required to specify DES is –

- Round function
- Key schedule
- Any additional processing – Initial and final permutation

Initial and Final Permutation

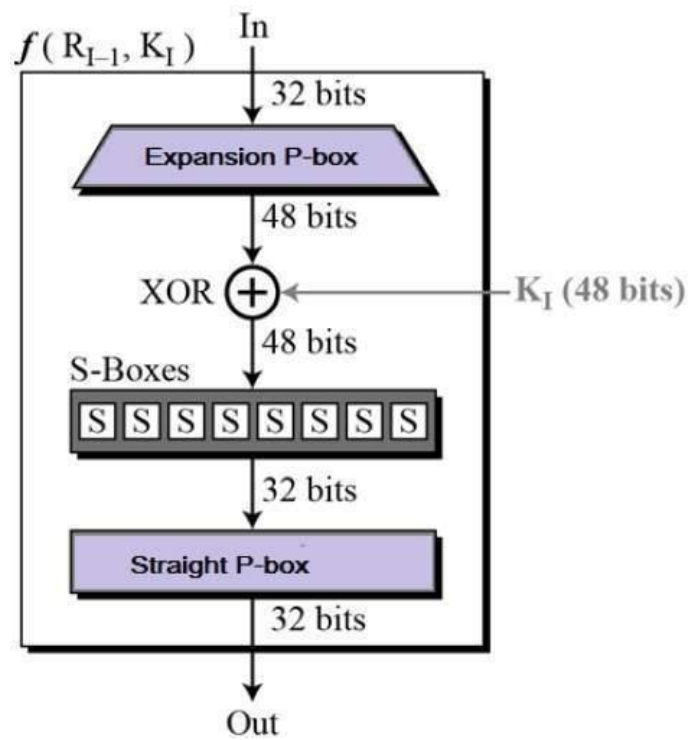
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The initial and final permutations are straight Permutation boxes (P-boxes) that are inverses of each other. They have no cryptography significance in DES. The initial and final permutations are shown as follows –



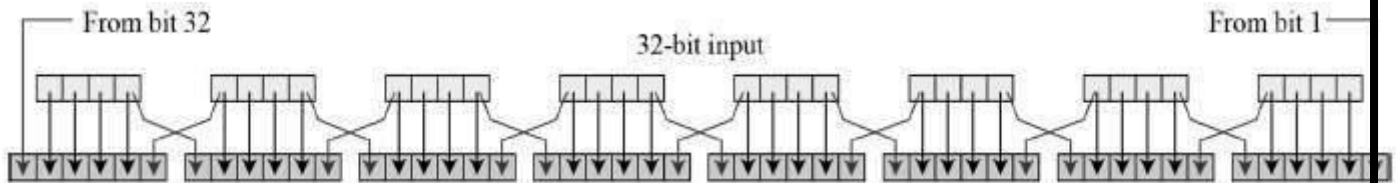
Round Function

The heart of this cipher is the DES function, f . The DES function applies a 48-bit key to the rightmost 32 bits to produce a 32-bit output.



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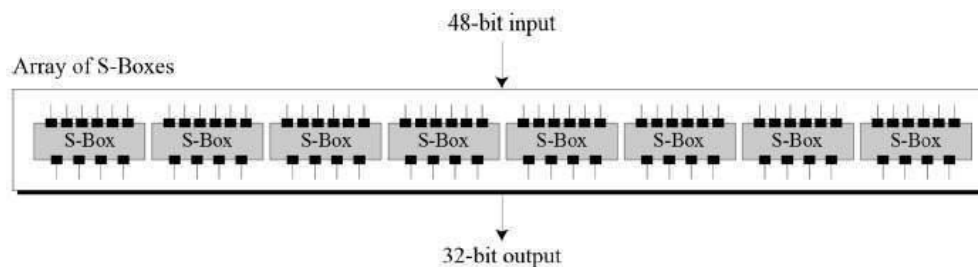
- **Expansion Permutation Box** – Since right input is 32-bit and round key is a 48-bit, we first need to expand right input to 48 bits. Permutation logic is graphically depicted in the following illustration –



- The graphically depicted permutation logic is generally described as table in DES specification illustrated as shown –

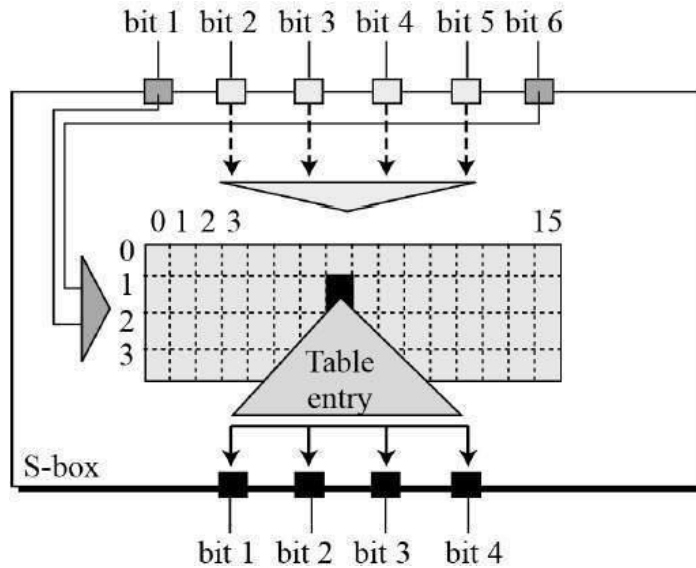
32	01	02	03	04	05
04	05	06	07	08	09
08	09	10	11	12	13
12	13	14	15	16	17
16	17	18	19	20	21
20	21	22	23	24	25
24	25	26	27	28	29
28	29	31	31	32	01

- **XOR (Whitener).** – After the expansion permutation, DES does XOR operation on the expanded right section and the round key. The round key is used only in this operation.
- **Substitution Boxes.** – The S-boxes carry out the real mixing (confusion). DES uses 8 S-boxes, each with a 6-bit input and a 4-bit output. Refer the following illustration –



- The S-box rule is illustrated below –

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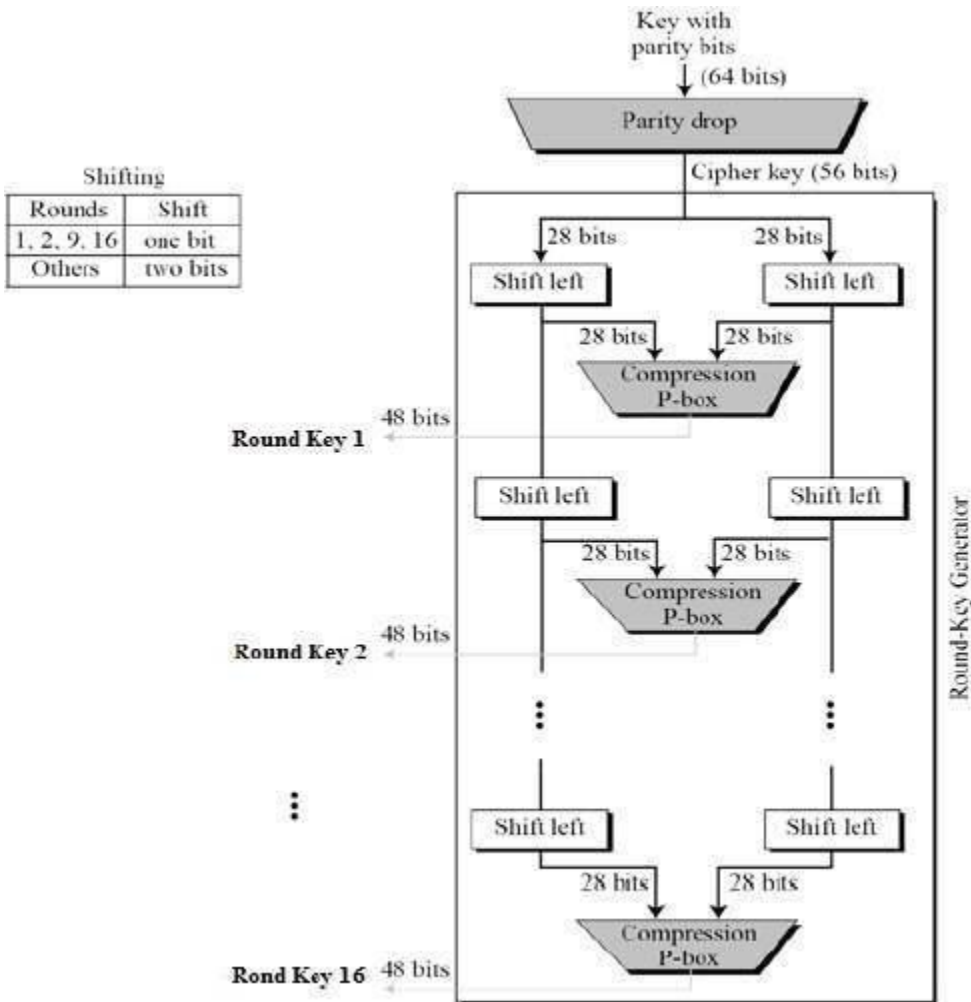
- There are a total of eight S-box tables. The output of all eight s-boxes is then combined in to 32 bit section.
- **Straight Permutation** – The 32 bit output of S-boxes is then subjected to the straight permutation with rule shown in the following illustration:

16	07	20	21	29	12	28	17
01	15	23	26	05	18	31	10
02	08	24	14	32	27	03	09
19	13	30	06	22	11	04	25

KeyGeneration

The round-key generator creates sixteen 48-bit keys out of a 56-bit cipher key. The process of key generation is depicted in the following illustration –

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The logic for Parity drop, shifting, and Compression P-box is given in the DES description.

DES Analysis

The DES satisfies both the desired properties of block cipher. These two properties make cipher very strong.

- **Avalanche effect** – A small change in plaintext results in the very great change in the ciphertext.
- **Completeness** – Each bit of ciphertext depends on many bits of plaintext.

During the last few years, cryptanalysis have found some weaknesses in DES when key selected are weak keys. These keys shall be avoided.

DES has proved to be a very well designed block cipher. There have been no significant cryptanalytic attacks on DES other than exhaustive key search.

Digital signatures

Digital signatures are the public-key primitives of message authentication. In the physical world, it is common to use handwritten signatures on handwritten or typed messages. They are used to bind signatory to the message.

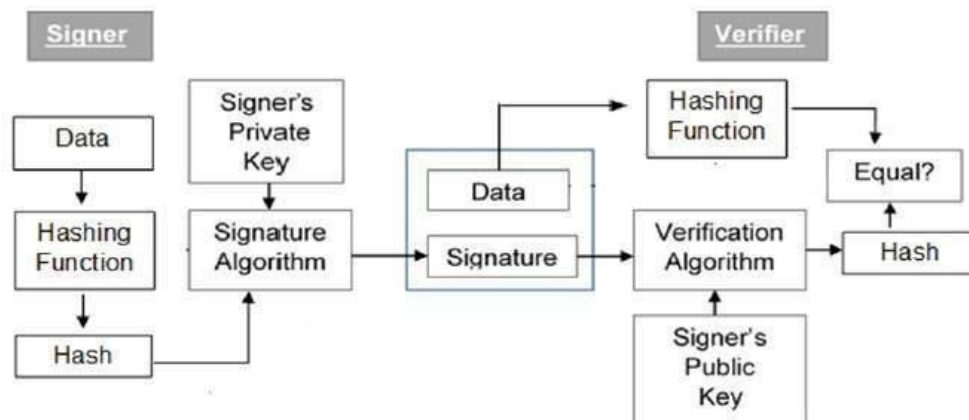
Similarly, a digital signature is a technique that binds a person/entity to the digital data. This binding can be independently verified by receiver as well as any third party.

Digital signature is a cryptographic value that is calculated from the data and a secret key known only by the signer.

In real world, the receiver of message needs assurance that the message belongs to the sender and he should not be able to repudiate the origination of that message. This requirement is very crucial in business applications, since likelihood of a dispute over exchanged data is very high.

Model of Digital Signature

As mentioned earlier, the digital signature scheme is based on public key cryptography. The model of digital signature scheme is depicted in the following illustration –



The following points explain the entire process in detail –

- Each person adopting this scheme has a public-private key pair.
- Generally, the key pairs used for encryption/decryption and signing/verifying are different. The private key used for signing is referred to as the signature key and the public key as the verification key.
- Signer feeds data to the hash function and generates hash of data.
- Hash value and signature key are then fed to the signature algorithm which produces the digital signature on given hash. Signature is appended to the data and then both are sent to the verifier.

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- Verifier feeds the digital signature and the verification key into the verification algorithm. The verification algorithm gives some value as output.
- Verifier also runs same hash function on received data to generate hash value.
- For verification, this hash value and output of verification algorithm are compared. Based on the comparison result, verifier decides whether the digital signature is valid.
- Since digital signature is created by ‘_private’ key of signer and no one else can have this key; the signer cannot repudiate signing the data in future.

It should be noticed that instead of signing data directly by signing algorithm, usually a hash of data is created. Since the hash of data is a unique representation of data, it is sufficient to sign the hash in place of data. The most important reason of using hash instead of data directly for signing is efficiency of the scheme.

Let us assume RSA is used as the signing algorithm. As discussed in public key encryption chapter, the encryption/signing process using RSA involves modular exponentiation.

Signing large data through modular exponentiation is computationally expensive and time consuming. The hash of the data is a relatively small digest of the data, hence **signing a hash is more efficient than signing the entire data**.

Importance of Digital Signature

Out of all cryptographic primitives, the digital signature using public key cryptography is considered as very important and useful tool to achieve information security.

Apart from ability to provide non-repudiation of message, the digital signature also provides message authentication and data integrity. Let us briefly see how this is achieved by the digital signature –

- **Message authentication** – When the verifier validates the digital signature using public key of a sender, he is assured that signature has been created only by sender who possess the corresponding secret private key and no one else.
- **Data Integrity** – In case an attacker has access to the data and modifies it, the digital signature verification at receiver end fails. The hash of modified data and the output provided by the verification algorithm will not match. Hence, receiver can safely deny the message assuming that data integrity has been breached.
- **Non-repudiation** – Since it is assumed that only the signer has the knowledge of the signature key, he can only create unique signature on a given data. Thus the receiver can present data and the digital signature to a third party as evidence if any dispute arises in the future.

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By adding public-key encryption to digital signature scheme, we can create a cryptosystem that can provide the four essential elements of security namely – Privacy, Authentication, Integrity, and Non-repudiation.

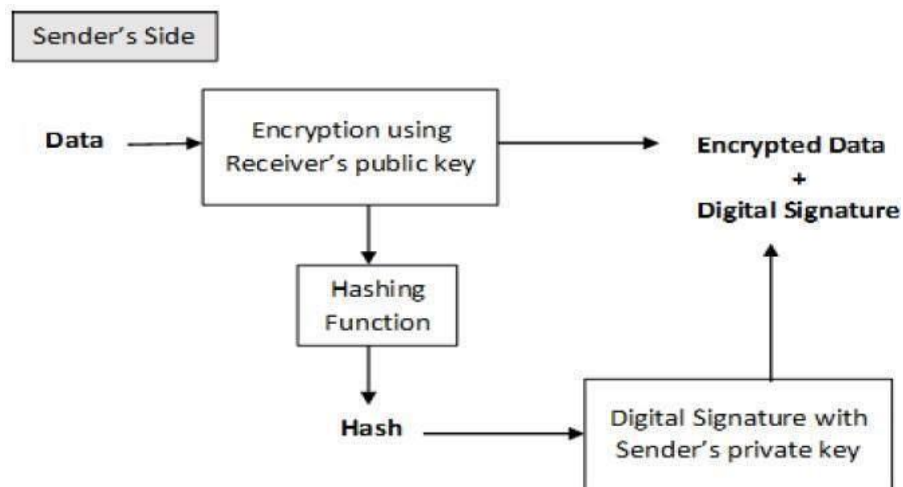
Encryption with Digital Signature

In many digital communications, it is desirable to exchange an encrypted messages than plaintext to achieve confidentiality. In public key encryption scheme, a public (encryption) key of sender is available in open domain, and hence anyone can spoof his identity and send any encrypted message to the receiver.

This makes it essential for users employing PKC for encryption to seek digital signatures along with encrypted data to be assured of message authentication and non-repudiation.

This can archived by combining digital signatures with encryption scheme. Let us briefly discuss how to achieve this requirement. There are **two possibilities, sign-then-encrypt** and **encrypt-then-sign**.

However, the crypto system based on sign-then-encrypt can be exploited by receiver to spoof identity of sender and sent that data to third party. Hence, this method is not preferred. The process of encrypt-then-sign is more reliable and widely adopted. This is depicted in the following illustration –



The receiver after receiving the encrypted data and signature on it, first verifies the signature using sender's public key. After ensuring the validity of the signature, he then retrieves the data through decryption using his private key.

The most distinct feature of Public Key Infrastructure (PKI) is that it uses a pair of keys to achieve the underlying security service. The key pair comprises of private key and public key.

Since the public keys are in open domain, they are likely to be abused. It is, thus, necessary to establish and maintain some kind of trusted infrastructure to manage these keys.

Key Management

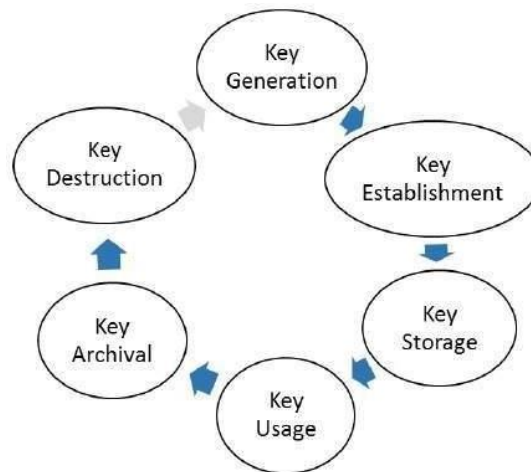
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It goes without saying that the security of any cryptosystem depends upon how securely its keys are managed. Without secure procedures for the handling of cryptographic keys, the benefits of the use of strong cryptographic schemes are potentially lost.

It is observed that cryptographic schemes are rarely compromised through weaknesses in their design. However, they are often compromised through poor key management.

There are some important aspects of key management which are as follows –

- Cryptographic keys are nothing but special pieces of data. Key management refers to the secure administration of cryptographic keys.
- Key management deals with entire key lifecycle as depicted in the following illustration –



- There are two specific requirements of key management for public key cryptography.
 - **Secrecy of private keys.** Throughout the key lifecycle, secret keys must remain secret from all parties except those who are owner and are authorized to use them.
 - **Assurance of public keys.** In public key cryptography, the public keys are in open domain and seen as public pieces of data. By default there are no assurances of whether a public key is correct, with whom it can be associated, or what it can be used for. Thus key management of public keys needs to focus much more explicitly on assurance of purpose of public keys.

The most crucial requirement of ‘assurance of public key’ can be achieved through the public-key infrastructure (PKI), a key management systems for supporting public-key cryptography.

Public Key Infrastructure (PKI)

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PKI provides assurance of public key. It provides the identification of public keys and their distribution. An anatomy of PKI comprises of the following components.

- Public Key Certificate, commonly referred to as 'digital certificate'.
- Private Key tokens.
- Certification Authority.
- Registration Authority.
- Certificate Management System.

Digital Certificate

For analogy, a certificate can be considered as the ID card issued to the person. People use ID cards such as a driver's license, passport to prove their identity. A digital certificate does the same basic thing in the electronic world, but with one difference.

Digital Certificates are not only issued to people but they can be issued to computers, software packages or anything else that need to prove the identity in the electronic world.

- Digital certificates are based on the ITU standard X.509 which defines a standard certificate format for public key certificates and certification validation. Hence digital certificates are sometimes also referred to as X.509 certificates.

Public key pertaining to the user client is stored in digital certificates by The Certification Authority (CA) along with other relevant information such as client information, expiration date, usage, issuer etc.

- CA digitally signs this entire information and includes digital signature in the certificate.
- Anyone who needs the assurance about the public key and associated information of client, he carries out the signature validation process using CA's public key. Successful validation assures that the public key given in the certificate belongs to the person whose details are given in the certificate.

ommerce - Security Systems

Security is an essential part of any transaction that takes place over the internet. Customers will lose his/her faith in e-business if its security is compromised. Following are the essential requirements for safe e-payments/transactions

–

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- **Confidentiality** – Information should not be accessible to an unauthorized person. It should not be intercepted during the transmission.
- **Integrity** – Information should not be altered during its transmission over the network.
- **Availability** – Information should be available wherever and whenever required within a time limit specified.
- **Authenticity** – There should be a mechanism to authenticate a user before giving him/her an access to the required information.
- **Non-Reputability** – It is the protection against the denial of order or denial of payment. Once a sender sends a message, the sender should not be able to deny sending the message. Similarly, the recipient of message should not be able to deny the receipt.
- **Encryption** – Information should be encrypted and decrypted only by an authorized user.
- **Auditability** – Data should be recorded in such a way that it can be audited for integrity requirements.

Measures to ensure Security

Major security measures are following –

- **Encryption** – It is a very effective and practical way to safeguard the data being transmitted over the network. Sender of the information encrypts the data using a secret code and only the specified receiver can decrypt the data using the same or a different secret code.
- **Digital Signature** – Digital signature ensures the authenticity of the information. A digital signature is an e-signature authenticated through encryption and password.
- **Security Certificates** – Security certificate is a unique digital id used to verify the identity of an individual website or user.

Security Protocols in Internet

We will discuss here some of the popular protocols used over the internet to ensure secured online transactions.

Secure Socket Layer (SSL)

It is the most commonly used protocol and is widely used across the industry. It meets following security requirements –

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- Authentication
- Encryption
- Integrity
- Non-reputability

"https://" is to be used for HTTP urls with SSL, where as "http://" is to be used for HTTP urls without SSL.

Secure Hypertext Transfer Protocol (SHTTP)

SHTTP extends the HTTP internet protocol with public key encryption, authentication, and digital signature over the internet. Secure HTTP supports multiple security mechanism, providing security to the end-users. SHTTP works by negotiating encryption scheme types used between the client and the server.

Secure Electronic Transaction

It is a secure protocol developed by MasterCard and Visa in collaboration. Theoretically, it is the best security protocol. It has the following components –

- **Card Holder's Digital Wallet Software** – Digital Wallet allows the card holder to make secure purchases online via point and click interface.
- **Merchant Software** – This software helps merchants to communicate with potential customers and financial institutions in a secure manner.
- **Payment Gateway Server Software** – Payment gateway provides automatic and standard payment process. It supports the process for merchant's certificate request.
- **Certificate Authority Software** – This software is used by financial institutions to issue digital certificates to card holders and merchants, and to enable them to register their account agreements for secure electronic commerce.

The process of obtaining Digital Certificate by a person/entity is depicted in the following illustration.

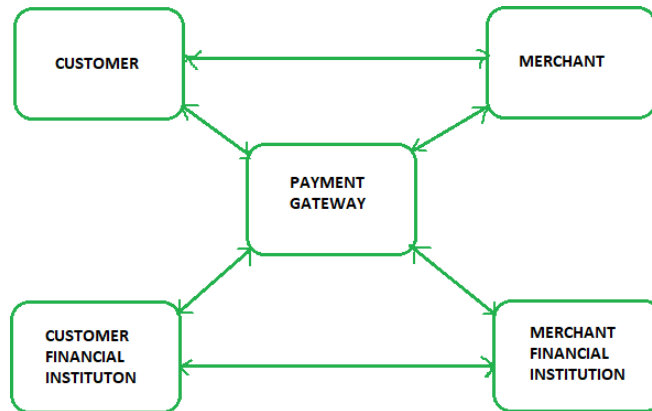
Secure Electronic Transaction (SET) Protocol

Secure Electronic Transaction or SET is a system which ensures security and integrity of electronic transactions done using credit cards in a scenario. SET is not some system that enables payment but it is a security protocol applied on those payments. It uses different encryption and hashing techniques to secure payments over internet done through credit cards. SET protocol was supported in development by major organizations like Visa, Mastercard, Microsoft which provided its Secure Transaction Technology (STT) and NetScape which provided technology of Secure Socket Layer (SSL).

SET protocol restricts revealing of credit card details to merchants thus keeping hackers and thieves at bay. SET protocol includes Certification Authorities for making use of standard Digital Certificates like X.509 Certificate.

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Before discussing SET further, let's see a general scenario of electronic transaction, which includes client, payment gateway, client financial institution, merchant and merchant financial institution.



Requirements in SET :

SET protocol has some requirements to meet, some of the important requirements are :

- It has to provide mutual authentication i.e., customer (or cardholder) authentication by confirming if the customer is intended user or not and merchant authentication.
- It has to keep the PI (Payment Information) and OI (Order Information) confidential by appropriate encryptions.
- It has to be resistive against message modifications i.e., no changes should be allowed in the content being transmitted.
- SET also needs to provide interoperability and make use of best security mechanisms.

Participants in SET:

In the general scenario of online transaction, SET includes similar participants:

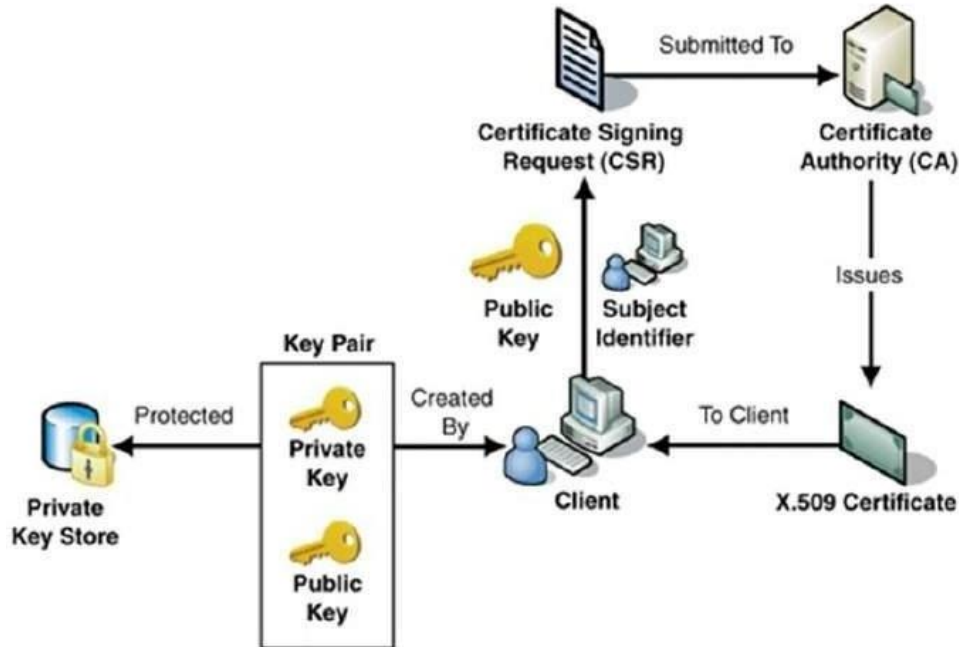
1. **Cardholder** – customer
2. **Issuer** – customer financial institution
3. **Merchant**
4. **Acquirer** – Merchant financial
5. **Certificate authority** – Authority which follows certain standards and issues certificates(like X.509V3) to all other participants.

SET functionalities:

- **Provide Authentication**
 - **Merchant Authentication** – To prevent theft, SET allows customers to check previous relationships between merchant and financial institution. Standard X.509V3 certificates are used for this verification.
 - **Customer / Cardholder Authentication** – SET checks if use of credit card is done by an authorized user or not using X.509V3 certificates.
- **Provide Message Confidentiality:** Confidentiality refers to preventing unintended people from reading the message being transferred. SET implements confidentiality by using encryption techniques. Traditionally DES is used for encryption purpose.

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- **Provide Message Integrity:** SET doesn't allow message modification with the help of signatures. Messages are protected against unauthorized modification using RSA digital signatures with SHA-1 and some using HMAC with SHA-1,



As shown in the illustration, the CA accepts the application from a client to certify his public key. The CA, after duly verifying identity of client, issues a digital certificate to that client.

Certifying Authority (CA)

As discussed above, the CA issues certificate to a client and assist other users to verify the certificate. The CA takes responsibility for identifying correctly the identity of the client asking for a certificate to be issued, and ensures that the information contained within the certificate is correct and digitally signs it.

Key Functions of CA

The key functions of a CA are as follows –

- **Generating key pairs** – The CA may generate a key pair independently or jointly with the client.
- **Issuing digital certificates** – The CA could be thought of as the PKI equivalent of a passport agency – the CA issues a certificate after client provides the credentials to confirm his identity. The CA then signs the certificate to prevent modification of the details contained in the certificate.

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- **Publishing Certificates** – The CA need to publish certificates so that users can find them. There are two ways of achieving this. One is to publish certificates in the equivalent of an electronic telephone directory. The other is to send your certificate out to those people you think might need it by one means or another.
- **Verifying Certificates** – The CA makes its public key available in environment to assist verification of his signature on clients' digital certificate.
- **Revocation of Certificates** – At times, CA revokes the certificate issued due to some reason such as compromise of private key by user or loss of trust in the client. After revocation, CA maintains the list of all revoked certificate that is available to the environment.

Classes of Certificates

There are four typical classes of certificate –

- **Class 1** – These certificates can be easily acquired by supplying an email address.
- **Class 2** – These certificates require additional personal information to be supplied.
- **Class 3** – These certificates can only be purchased after checks have been made about the requestor's identity.
- **Class 4** – They may be used by governments and financial organizations needing very high levels of trust.

Registration Authority (RA)

CA may use a third-party Registration Authority (RA) to perform the necessary checks on the person or company requesting the certificate to confirm their identity. The RA may appear to the client as a CA, but they do not actually sign the certificate that is issued.

Certificate Management System (CMS)

It is the management system through which certificates are published, temporarily or permanently suspended, renewed, or revoked. Certificate management systems do not normally delete certificates because it may be necessary to prove their status at a point in time, perhaps for legal reasons. A CA along with associated RA runs certificate management systems to be able to track their responsibilities and liabilities.

Private Key Tokens

While the public key of a client is stored on the certificate, the associated secret private key can be stored on the key owner's computer. This method is generally not adopted. If an attacker gains access to the computer, he can easily gain access to private key. For this reason, a private key is stored on secure removable storage token access to which is protected through a password.

Different vendors often use different and sometimes proprietary storage formats for storing keys. For example, Entrust uses the proprietary .epf format, while Verisign, GlobalSign, and Baltimore use the standard .p12 format.

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Hierarchy of CA

With vast networks and requirements of global communications, it is practically not feasible to have only one trusted CA from whom all users obtain their certificates. Secondly, availability of only one CA may lead to difficulties if CA is compromised.

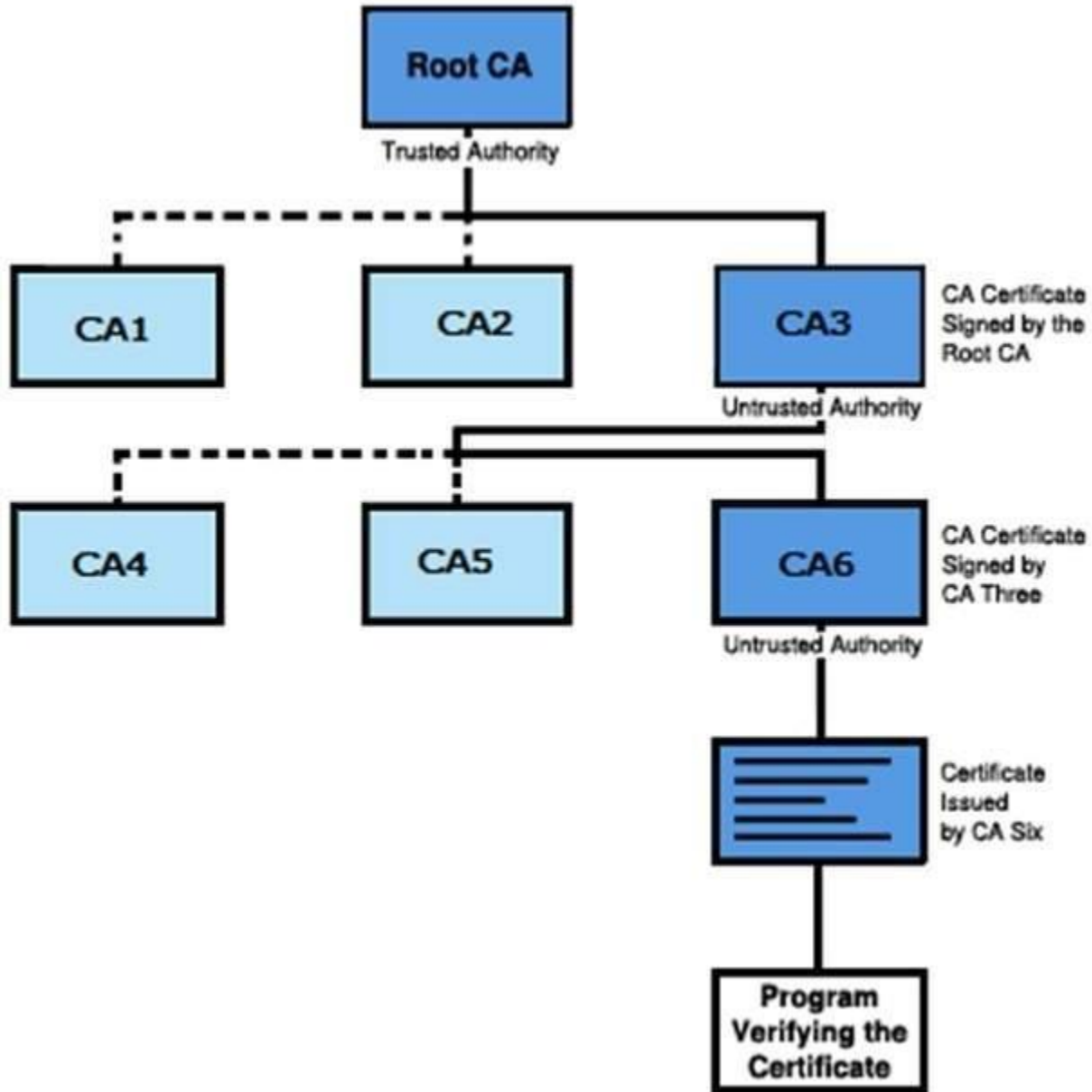
In such case, the hierarchical certification model is of interest since it allows public key certificates to be used in environments where two communicating parties do not have trust relationships with the same CA.

- The root CA is at the top of the CA hierarchy and the root CA's certificate is a self-signed certificate.
- The CAs, which are directly subordinate to the root CA (For example, CA1 and CA2) have CA certificates that are signed by the root CA.
- The CAs under the subordinate CAs in the hierarchy (For example, CA5 and CA6) have their CA certificates signed by the higher-level subordinate CAs.

Certificate authority (CA) hierarchies are reflected in certificate chains. A certificate chain traces a path of certificates from a branch in the hierarchy to the root of the hierarchy.

The following illustration shows a CA hierarchy with a certificate chain leading from an entity certificate through two subordinate CA certificates (CA6 and CA3) to the CA certificate for the root CA.

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Verifying a certificate chain is the process of ensuring that a specific certificate chain is valid, correctly signed, and trustworthy. The following procedure verifies a certificate chain, beginning with the certificate that is presented for authentication –

- A client whose authenticity is being verified supplies his certificate, generally along with the chain of certificates up to Root CA.
- Verifier takes the certificate and validates by using public key of issuer. The issuer's public key is found in the issuer's certificate which is in the chain next to client's certificate.

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- Now if the higher CA who has signed the issuer's certificate, is trusted by the verifier, verification is successful and stops here.
- Else, the issuer's certificate is verified in a similar manner as done for client in above steps. This process continues till either trusted CA is found in between or else it continues till Root CA.

Module 3: E-Business

INTERNET BOOKSHOP:

Internet Bookshops are the online bookshops that allow the user to search the items of his interest, navigate, make a query, communicate, place an order, bargain and negotiate. At its simplest the Internet Bookshop or online bookshop list the products for sale or the services offered and invite the customer to phone, fax or e-mail their order.

Advantages of internet book shops:

The major advantages of Internet bookshops are

- Providing access to information to anyone, at anytime, from anywhere is the top priority in library business. Online bookstores provide just such an environment of guaranteed access to people who can't leave their homes to shop for books, or who need a special book right away.
- One of the virtues of online bookstores is that you can take your time searching for books at any time of day or night.
- Online bookstores allow you to view a lot of books at one time. Usage of these different stores varies with the individual. Busy people may prefer to surf the online bookstores. People who like selecting books at their leisure will visit traditional bookshops.
- We think of online bookshops as the virtual counterparts, exponentially enlarged of our neighborhood bookstores. But, in effect, they are really just databases-repositories of a vast amount of information about books currently on the market. And for the moment at least, all Internet subscribers can use these databases free of charges- no purchase is required.
- Online bookstores are extremely convenient for scholars and other people looking for specific books; you can find what you need very quickly. People who do not live near a bookshop, or cannot get to one for some reason, can also avoid the time and trouble of traveling long distances for this purpose.
- There is an explosion of information in every field. A huge volume of literature is being published in each subject. The publishers' lists may not reach the library or the user in time, but these lists can be accessed through the Internet Bookshops immediately. Such lists save the time of librarian in searching for the latest literature.

INTERNET NEWSPAPER:

An **online** newspaper is the **online** version of a newspaper, either as a stand-alone publication or as the **online** version of a printed periodical. Going **online** created more opportunities for newspapers, such as competing with broadcast journalism in presenting breaking **news** in a more timely manner.

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Advantages of the Online Newspaper:

- Extremely fast news
- Completely Free
- No personal information required
- Interactive news
- Environmentally friendly

Disadvantages of the Online Newspaper:

- Not accessible in some parts of the world
- Difficult to navigate the Internet
- Opinions of the readers can be posted making the news site less objective
- Difficult to navigate the newspaper site
- Still changing as it evolves

Online banking gives you the ability to manage money online with your mobile device or computer. There's no need to visit a bank branch, and you can do what you need to do when it's most convenient for you. They can be easier to use, they usually have higher interest rates, they're free or inexpensive, and they're better for tracking spending.

Money is increasingly electronic. Some people still use cash, but other forms of payment have become more popular. Why? They can be easier to use, they're free or inexpensive, and they're better for tracking spending. Banks play a meaningful role in that evolution.

Online banking used to be limited to banks that operated exclusively online. But now, even big brick-and-mortar banks and local credit unions offer online services. That said, you can still use an online-only bank, and we'll discuss the pros and cons of different choices below.

Online Banking Services

To bank online, you'll need to use your computer or an app on your mobile device. Getting started can be tricky if you're not comfortable with technology, but everything gets easier once you're set up.

Open accounts: You can open checking, savings, and other accounts online, without the need to print or sign anything. In the past, you had to sit with a personal banker during business hours and fend off numerous sales pitches. With electronic signature capability, the entire process might take less than ten minutes.

Pay bills: Instead of writing checks to pay bills, your bank can print and mail a check for you—month after month. It's also possible to transfer money to your payee electronically, even if the amount you owe changes every month. For complete details, learn how to use online bill pay.

Transfer funds: Need to move money from your checking account to your savings account? How about putting extra cash into a certificate of deposit (CD) or opening a brand-new CD? You don't need to visit a branch or wait on hold to get those things done. You can even link bank accounts at different banks and zap money back and forth.

Apply for loans: Loans are a –paperwork intensive process. But they don't have to be. Type in your information, which will speed the process of checking your credit, and your bank will get back to you with an answer. Some lenders operate entirely online, and they can make almost-instant lending decisions.

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Get good rates: Online banks are known for competitive rates. In theory, you should be able to earn more in online savings accounts and pay lower interest rates on loans. It's always a good idea to shop around and compare online banking rates to traditional rates, but you'll almost always do better online. Some brick-and-mortar banks offer online-only options. To use those accounts, you'll have to give up your paper statements (which you might prefer anyway) and the ability to bank with a teller.

Deposit checks: When somebody pays you with a check, there are several ways to deposit it. The fastest and easiest option is to use remote check deposit: Snap a photo of the check and submit it to your bank for payment. There's no need to visit a branch or mail the check in. For more details, learn how to deposit checks with your mobile device.

Stay informed: In addition to manually checking your account online, you can use –old-fashioned! text messages to manage your account, check balances, and more. Sometimes it feels like too much work to open an app and log in just to find out how much you have available. Find out exactly what types of services are available and how you benefit from texting with your bank.

View history: Need to see if that check cleared, or how much your employer paid you? It's easy to view transactions online, download historical statements, and search for specific events.

Dodge fees: Online banking services typically cost less than traditional brick-and-mortar accounts—while still offering competitive rates. You've got a good chance of landing a free checking account and avoiding monthly maintenance fees with an online bank.

Pros and Cons of Online Banking

There are numerous benefits to online banking, and it's worth at least having the option to bank online. But traditional banks and credit unions also have their place.

In-person services: Banks do more than just hold money and shuffle it around. They can also provide notary services, safety deposit boxes, and official checks in an instant. You might not need those services often, but when you do, it's typically during an important event. Evaluate whether or not it makes sense to keep a local account open.

Technology issues: If you're not comfortable with technology, online banking may be more trouble than it's worth. Plus, glitches happen, and if your computer (or the bank's computer) isn't working, then there's not much you can do. For complex situations like pesky customer service issues or discussions about different types of loans, it might be best to have a face-to-face conversation.

No cash? There's also the issue of getting cash. Online-only banks typically provide a debit card that you can use to withdraw cash, and they may even belong to networks with free ATM access. But for large deposits or withdrawals, a branch is always best.

Security

All that might sound good, but is your money safe?

Online banking is typically considered safer than traditional banking. Having your pay directly deposited into your bank account eliminates the risk of somebody stealing your check from the mail. Plus, nobody can copy your account information from checks that you send to billers when bank computers send that information back and forth securely. If fraud or errors occur, federal law often protects you, as long as you act quickly.

Staying safe is relatively easy. Keep your computer and devices up-to-date. In particular, ensure that the operating system, antivirus software, and firewall are kept current. Use difficult-to-guess passwords, and never write them

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down. Finally, never respond to emails, phone calls, or text messages that ask you to provide sensitive account (or personal) information.

To be sure, scams occur online. As long as you only send money to somebody that you're 100 percent certain you know, you should be able to avoid most of them. Just remember that the riskiest actions are giving money or information to somebody else.

Online Auctions

Definition: Virtual auctions on the internet. The seller sells the product or service to the person who bids the highest price. For sellers, online auctions open up new sales channels for new products and offer buyers favorable purchasing conditions.

Online auctions have effectively created a giant virtual marketplace where people can gather to buy, sell, trade and check out the goods of the day. They're enormously popular, high-traffic venues where you can begin selling product almost immediately, with...

- No overhead or upfront costs
- No sales staff or distributors
- No website of your own
- No initial investment (you'll pay between 2 and 5 percent of your final sale price to the auction site)

In this massive marketplace, the auction site that rules the game is eBay. According to the Neilson Ratings, eBay is among the top ten most-trafficked sites on the Internet. eBay leads the online auction industry with a more than 60 percent share of the market, while its closest competitor, Yahoo! Auctions, is only half its size. Amazon.com Auctions follows at a distant third.

The amount of traffic these sites attract make online auctions an ideal place to capitalize on readily available, widespread exposure. However, know this: The competition is fierce in popular categories, and your product can easily get lost among the hundreds of listings.

So whether you're selling a knick-knack or two or becoming a full-time baseball card dealer, there are a number of things you must do to harness the volumes of traffic heading your way and generate the highest profits possible:

Step 1. Select your site. First of all, you have to think about which online auction site you want to use. eBay is the obvious choice because of its reputation and the amount of traffic it receives. But different auction sites tend to cater to different markets. To determine which site is best for your product, check out the top three or four in your field-- look at specialized auction sites as well as the big ones mentioned above. There are hundreds of specialized online auctions that cover the spectrum from antique books to business liquidations.

Check out item quantities and bid lists to see how much demand there is for your product. While you're there, you might even want to try bidding on a few items to get a feel for the process and the competition involved. (But don't ever bid on an item you don't plan to buy!)

Step 2. Choose your products. Are you going to sell unique, one-of-a-kind products item by item? Or do you have a product you can sell in quantity? Is there a demand for your product? (This is less of an issue for one-of-a-kind items.) What kind of profit margin do you expect to be making? (This can determine whether or not you'll have to sell in quantity.)

In the world of online auctions, niche markets are responsible for 43 percent of total sales. Not bad, hey? But don't disregard the remaining 57 percent that covers non-niche markets! The bottom line is, you can make money with both.

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Collectibles are the bestselling items at auction sites, with computer hardware and event tickets in second place, and toys and books hovering around third. But while popular items may be easy for you to sell, you could also make a killing on a unique item with a high profit margin. Believe it or not, people are making money hand over fist from specialty items like cigars and lobster.

Step 3. Look at listing options. The next thing you need to think about is how you'll sell your product. Auction sites typically offer a variety of listing options for you to choose from, including:

- Regular listings.** A regular listing is just that--you pick your category and your product gets listed in it. While this is the most common (and really the least effective) way to list your product, you should definitely start with this option. You'll want to see how your product does before you decide to spend money on featured listings.
- Reserve price auctions.** If you place a "reserved price" on your item, it means that you've specified the amount at which it should sell. This is done to prevent "auction sniping," which happens when bidders lay low until the very last moment, then grab your item without starting a bidding competition. Reserved price auctions can be to your benefit, but they may discourage bidders who are looking for the best deal.
- Dutch auctions.** Also known as "English auctions," these are one of the best ways for people selling in quantity to place their products because you can list multiple identical items at once in each auction. However, on eBay you must have a "feedback rating" (see Step 6) of 50+ and you must have been registered for more than 60 days before you can choose this option.
- Featured items.** On most of the larger auction sites, you can get your item rotated through the site's homepage as well as listed in the "featured items" section for about \$20. For approximately \$15, you can have your item appear in your category's "featured items" section, or simply at the top of the list. You can also have your photos displayed in a gallery for about 25 cents, or featured as a large photo at the top of a gallery for close to \$20.

You also have the choice of listing your items for 3, 5, 7 or 10 days--and, of course, you always have the option to re-list at the end of this time. The standard option is a 7-day listing with an automatic re-listing for a specified period of time.

Step 4. Choose your category. Explore the product categories on the various auction sites to broaden your perspective of what goes where. While you're doing this, check out the competition in different categories and have a look at how much bidding is going on. Then do a search on similar and related products, determine which ones sell best, and see which categories they're in. You'll usually be able to pick one main category and one sub-category--use this method for both. And be sure to check to see how easily your product can be found using the site's search tools before you settle on a category.

Step 5. Create your ad. Once you've decided how and where to list your product, you need to turn your attention toward selling it. And that means you need excellent advertising. So think about your target market--who's going to buy your product and, perhaps more importantly, why. You need to grab their attention and motivate them to buy from you.

How? Well, first you need a very good title. It's really important that you're specific: Instead of saying "Doll" in your title, for example, say "Two-foot-tall dancing Elvis doll." Don't assume your bidders will understand you--make everything as clear as possible for them. And make it as exciting as possible, too. You'll probably have to pay a bit more for special formatting like bolding or highlighting (\$1 to \$2), but these can be a good way to grab the attention of potential buyers. Use exciting and convincing words that draw the buyer to your item: "Unique two-foot-tall dancing Elvis doll -- Collector's Edition."

The same techniques apply to your product description. Expand as much as possible on your product--obviously, there's only so much you can say about a baseball bat, but what if it's an original 1915 Louisville Slugger used by Babe Ruth himself in warm up? Try to create a story around your product.

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Think about other ways you can motivate your bidders. Can you provide money-back guarantees, free shipping or bonus products? Tell them what you have to offer! And don't forget about photos! People don't want to buy what they can't see, and on average, they'll pay at least 10 percent more for an item that's accompanied by a photo.

Step 6. Establish trust. The best way to establish yourself as a trustworthy, reliable seller in an online auction is by having a good feedback rating. A feedback rating is a listing of customer comments, rated as positive (+1), neutral (0), or negative (-1). If you're not trustworthy, your feedback rating will warn other buyers to stay away from you. If you have a positive rating, you can increase your sales by as much as 7 to 9 percent (and this number will steadily increase as the feedback rating system catches on).

To ensure you get a good feedback rating, make sure you always:

- List shipping costs (or additional costs) up front;
- Deliver your product right away;
- Deliver exactly what you've advertised;
- Answer buyers' questions immediately; and
- Always, always follow up with great customer service.

Step 7. Get exposure. You've put all this time and effort into creating a great ad for the auction site, so use it to your advantage! Draw more traffic to your own site by posting banners or links to your site on your ad. (Be careful, however, that you aren't using the ad primarily as a means of redirecting traffic--this is called a "signpost" and will get you kicked off the auction site.)

Unfortunately, while eBay will allow you to link directly from your ad to other items that you're selling on eBay, you can no longer post links to your homepage on your ad. However, you can still link to your site from your eBay "About Me" page--so be sure to take advantage of this option!

Most important is that you keep a list of all your buyers and e-mail them "thanks for purchasing" messages, new offers, complementary product information, and newsletters on a regular basis. Your best customers are your repeat customers--they'll be responsible for 80 percent of your sales! Once you get your name out there, you'll do nothing but profit by keeping it out there.

Step 8. Test! You should always be testing and tweaking your auction listings. Even if they're really good, you may discover that one or two simple changes dramatically increase your sales. Start by doing regular listings on two or three different auction sites, and, changing only one element at a time, test the following:

- Ad copy and photos
- Pricing
- Timing
- Different products

Once you've settled on the combination that works best, try out different auctioning options (Featured if your sales warrant it; Dutch if you have multiple products) to see which will sell more products for you at higher winning bids.

eBay reports that as many as 70 percent of the items listed for auction on their site result in winning bids, so if you're below or close to this percentage, keep working on it: With these tips under your belt, you can do much better.

Your ability to set prices that attract bidders, write compelling ads, choose the best categories that draw the most potential bidders, and ensure that your auction closes with the highest profit margin will have a dramatic impact on your success in the competitive arena of online auctions. But you need to educate yourself and test the waters carefully before diving in if you plan to be successful. People do make money through online auctions, so it's not unreasonable to think you can profit, too. Just proceed with caution. And market smart.

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Online share dealing:

What is Online Trading

Online trading involves the trading of securities through an online platform. Online trading portals facilitate the trading of various financial instruments such as equities, mutual funds, and commodities. Angel Broking offers Angel Speed Pro - an online trading platform that helps investors and traders to buy/sell stocks and other financial instruments.

How to Trade Online

- **Open Demat and Trading Account:**

To begin trading online you need to open an online trading account with an online broking firm. Angel Broking offers reliable Demat and trading accounts services with low maintenance cost and affordable brokerage. It is essential to choose a broker who is a registered member of all the stock exchanges and is certified by the SEBI.

- **Learn all the Stock Market Basics:**

The stock market functions on the system of supply and demand. Learning to trade begins with gaining more knowledge about the share market investment. Keeping tabs on financial news and websites, listening to pod-casts and taking up investing courses are all excellent ways to become an efficient investor.

- **Practice with an Online Stock Simulator:**

Online stock trading simulators are a great way to learn online trading. Since it is a simulator, the losses you make would not affect you, hence you can learn trade without any fear.

- **Draft a plan:**

While you trade, it is very important to think through your investment strategies. Decide in advance how much you are willing to invest in a particular company and set limits on the amount of loss you are willing to bear.

If you bear all these points in mind, online share trading will be an easy and profitable task for you. Practice is the key to successful online trading. Stock trading is a long-term investment and requires patience and perseverance.

It involves buying and selling of securities such as stocks, bonds, and other related financial instruments online. For this purpose, you will require a Demat account and a trading account. A Demat account acts as the common repository to store the purchased units of stocks whereas the trading account acts as the platform to buy and sell the share. A bank account is linked to the trading account to facilitate funding of trade.

The major benefit of online trading is that investor can seek the help of dedicated customer care in case of any clarifications or queries.

Internet Gambling

Internet Gambling is a serious problem. Online casinos have sprung up practically overnight into a multimillion-dollar business, attracting a large number of gamblers worldwide. Gambling has been around for decades, but now access and opportunity are even greater with the invention of Internet gambling, bringing with it a new form of addictive behavior.

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Traditional gambling is glamorized on TV and in the media in a way that other addictions are not. Today, all anyone needs is a computer and the Internet to access the thousands of available online casinos. The 24-hour, seven-days a week availability of online casinos simulate the seductive and realistic experience of traditional casino luring millions of new users each year.

Teens are Most At-Risk

At an alarming rate, Internet gambling is a serious problem among teens. This accessibility also encourages a new breed of gambling addicts for teenagers and college students who can't access real casinos. Young adults who seek admission to an online gaming site can freely enter, as no one is there to check for proof of age or an ID. This has already created a stir among college campuses who have discovered students using their Internet privileges to gamble and for parents concerned about their young children having instant access to virtual casinos.

What are the signs?

Internet gambling addicts show an increasing need to bet more money more frequently. They tend to minimize their losses and exaggerate their potential winnings. They get caught up in the excitement of the gambling experience and the anonymity and privacy of gambling from one's own home makes Internet gambling more attractive as they easily hide their gambling habit.

Module 4: OVERVIEW OF ERP

THE EVOLUTION OF ERP SYSTEMS : A HISTORICAL PERSPECTIVE

The functional units of today's complex business environment require more and more interfunctional data flow for decision making, timely and efficient procurement of product parts, management of inventory, accounting, human resources, and distribution of goods and services. Management of such organizations need efficient information systems to improve competitiveness by cost reduction and better logistics. Enterprise resource-planning systems (ERP), or enterprise systems (Brady, Monk, & Wagner, 2001; Grant, 2003; Hamilton, 2002; Hossain, Patrick, & Rashid, 2002; O'Leary, 2000), are such software systems for business management encompassing modules supporting functional areas such as planning, manufacturing, sales, marketing, distribution, accounting, finances, human resource management, project management, inventory management, service and maintenance, transportation, and e-business. The architecture of the software facilitates transparent integration of modules providing flow of information between all functions within the enterprise in a consistently visible manner. Corporate computing with ERPs allows companies to implement a single integrated system by replacing or reengineering their mostly incompatible legacy information systems. The concept of the ERP system as –one database, one application and a unified interface across the entire enterprise (Tadger, 1998) can be illustrated, following Davenport (1998), with the diagram in Figure 1. The American Production and Inventory Control Society (APICS, 2001) has defined ERP systems as –a method for the effective planning and controlling of all the resources needed to take, make, ship and account for customer orders in a manufacturing, distribution or service company. An ERP system –comprises of a commercial software package that promises the seamless integration of all the information flowing through the company—financial, accounting, human resources, supply chain and customer information (Davenport, 1998). They are –configurable information systems packages that integrate information and information-based processes within and across functional areas in an organisation. ERP systems surfaced in the market in the late 1980s and the beginning of the 1990s, targeting mainly large complex business organizations. During the 1960s, most organisations designed, developed, and implemented centralised computing systems, mostly automating their inventory control systems using inventory control (IC) packages. Material requirements planning (MRP) systems were developed in the 1970s and involved mainly planning the product or parts requirements according to the master production schedule. Following this route, new software systems called manufacturing resources planning (MRP II) were introduced in the 1980s with an emphasis on optimizing manufacturing processes by synchronising the materials with production requirements. MRP II included areas such as shop floor and distribution management, project management, finance, human resource, and engineering. Based on the technological foundations of MRP and MRP II, ERP systems integrate business processes including manufacturing, distribution, accounting, finances, human resource management, project management, inventory management, service and maintenance, transportation providing accessibility, visibility, and consistency across the enterprise.

Manufacturing requirement planning.

In manufacturing, developing a plan for your resources is vital to your operation. Without resource planning, your operation will have a much more challenging time managing various areas within your supply chain such as inventory, production, and output. This is why utilizing a materials requirement planning (MRP) system can efficiently manage materials within production, making it much easier for project managers to order and organize materials waiting to be assembled. Through materials requirement planning (MRP), the need for manual materials planning is eliminated and the system is able to successfully carry out an efficient strategy. MRP has become a vital component in allowing manufacturers to keep up with a consistently growing demand. Utilizing a systemic approach, the system is able to efficiently keep production up to schedule through data analysis and simple integration. Although the system can not run a production facility all on its own, it still is able to maintain a steady flow of materials throughout the supply chain through decision-making capabilities. Various functions of an MRP

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system include the following: Inventory Management- Arguably the main objective of an MRP system, the feature is to ensure that materials are available at a moments notice. This eliminates the need for manual-entered data and is able to carry out material orders with ease. It also is able to alert the facility when products are ready to be delive
Cost Reduction - In correlation with inventory management, cost is reduced significantly. Through ensuring a steady flow of inventory, holding and untimely-delivery cost are reduced, ultimately bringing more revenue into the operation.
Production Optimization - Although the main goal of MRP is to oversee and manage materials, it benefits the rest of the system as well. As materials are flowing throughout the supply chain, equipment and employees are able to work at a much faster and efficient rate as well.
Implementing an MRP system can be extremely beneficial to your production facility, but as mentioned previously, the system is not enough by itself. As manufacturers are looking for ways to enhance production, many are coming to the same solution - advanced planning and scheduling software (APS).

MANUFACTURING RESOURCE SYSTEM

Manufacturing Resource Planning (MRP II) is an integrated information system used by businesses. Manufacturing Resource Planning (MRP II) evolved from early Materials Requirement Planning (MRP) systems by including the integration of additional data, such as employee and financial needs. The system is designed to centralize, integrate and process information for effective decision making in scheduling, design engineering, inventorymanagement and cost control in manufacturing. MRP II is a computer-based system that can create detail production schedules using real-time data to coordinate the arrival of component materials with machine and labor availability. MRP II is used widely by itself, but it's also used as a module of more extensive enterprise resource planning (ERP) systems.

CONCEPT OF ERP SYSTEM

Enterprise resource planning (ERP) is a process whereby a company, often a manufacturer, manages and integrates the important parts of its business. An ERP management information system integrates areas such as planning, purchasing, inventory, sales, marketing, finance and human resources. An ERP system supports most of the business system that maintains in a single database the data needed for a variety of business functions such as Manufacturing, Supply Chain Management, Financials, Projects, Human Resources and Customer Relationship Management .An ERP system is based on a common database and a modular software design. The common database can allow every department of a business to store and retrieve information in real-time. The information should be reliable, accessible, and easily shared. The modular software design should mean a business can select the modules they need, mix and match modules from different vendors, and add new modules of their own to improve business performance. Ideally, the data for the various business functions are integrated. In practice the ERP system may comprise a set of discrete applications, each maintaining a discrete data store within one physical database. The term ERP originally referred to how a large organization planned to use organizational wide resources. In the past, ERP systems were used in larger more industrial types of companies.

The advantages presented by the ERP are:

Optimization of business processes. Accurate and timely access to reliable information. The ability to share information between all components of the organization. Elimination of unnecessary operations and data. Reduction of time and costs of litigation . Then, as each module of the ERP system enters the same real-time database, another advantage is that no duplicate records or playback operations, i.e redundancy is avoided. The performance of all work units that make up their business because better use time is increased. If you previously had to make reports and take them from one place to another, now the time is spent on other activities. To improve performance and time, optimize the control and analysis of management decisions there in the long term, reduced costs for the company. Another obvious advantage is in terms of customer service, because the response time is reduced attention to them. When a company has an ERP system is more competitive in the environment in which it operates.

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Disadvantages of ERP are:

The installation of the ERP system is costly. ERP consultants are very expensive take approximately 60% of the budget. The success depends on the skills and experience of the workforce, including education and how to make the system work properly. Resistance in sharing internal information between departments can reduce the efficiency of the software. The systems can be difficult to use. Change of staff, companies can employ administrators who are not trained to manage the ERP system of the employing company, proposing changes in business practices that are not synchronized with the system. Having an ERP system has many advantages, but does not guarantee the total success of the company. Organizational culture, know how to involve staff and anticipate changes that will suffer the organization using this system of administration, are important elements for the completion of the implementation. The effectiveness of the ERP system may decrease if there is resistance to share information between business units or departments. Due to strong changes that implementation of the ERP system brings in the culture of work, there may be poorly trained or disinterested in making use of the same staff...

Business reasons for rise and popularity of ERP SYSTEM

Doug Schrock, consulting advisory services leader at Crowe. Therefore, it is important for company and IT decision-makers to identify when the time is right to purchase, upgrade or overhaul their entire ERP system. A recent Crowe Horwath report suggested three factors private equity firms should consider when making this decision: – Financial benefits: Company leaders should measure the potential financial gains from ERP implementation against the estimated return on investment (ROI). This is especially important when deciding between an upgrade or purchasing entirely new software. – Business needs: How closely an ERP package matches a company's needs is vital, as it has an effect on efficiency, ROI and the ability to upgrade the system in the future. – Available resources: In addition to significant costs, ERP implementation is an extensive process that requires time for employees to learn how to use the new systems. Therefore, it is important for a company to have the proper personnel and leaders in place to ensure a smooth transition. If purchasing an ERP software package is the first step, implementing the most effective strategies will soon follow. Among the sector's rapidly growing trends is the rise of mobile solutions to support ERP software. A recent survey by IDC and IFS found that nearly 60 percent of worldwide IT departments plan to invest more in mobile ERP than anything else. These strategies have proven beneficial to companies across the globe, including the African workforce, according to an IT Web report. With a large portion of Africa's mobile workforce lacking regular access to a computer, many companies have geared their systems toward mobile devices – and have benefited because of it. – One cannot underestimate the value this technology has added to companies by radically improving the way they're able to deliver services to their customers, said Cobus van Graan, CEO of Tracer Mobile Workforce. – Our local presence, flexible customization capability, agile approach and scalable solutions are just some of the reasons we're gaining widespread traction in Africa. Cloud-based ERP implementation is another possibility. This strategy is much easier and cost-efficient with regard to upgrades, allows for the possibility of a hybrid ERP solution and offers protection in the event of a natural disaster.

BUSINESS PROCESSES SUPPORTED BY [ERP] SYSTEM

VARIOUS BUSINESS FUNCTIONS IN AN ORGANIZATIONS:

Without appropriate organization on a variety of fronts, a business limps along, unable to set or achieve strategic plans. Organization and structure give employees a guide under which they can operate efficiently, and reduces duplication. Organization functions as the glue that holds all the pieces of your business together in pursuit of one ultimate goal – success. All businesses have a flow to their production. Whether you rely on work orders to start a job or call on clients to make a sale, there is a flow to your work. Organizing that flow is tantamount to completing each task so that you can collect your pay. For example, once you get a work order, you need to know what to do next, such as hiring help, gathering tools and setting a date to start the work. You follow a process to complete each

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job and provide your customers with invoices. Collections follow another process. Organization is key to maintaining the proper flow of work from start to finish. Communication on every level must follow a pattern so that you don't miss important client calls and deadlines. Developing a chain of command at your company ensures that communication flows properly to everyone who needs to be involved in a company decision or policy implementation. How you organize your flow of communication determines the success you'll see. Even if you are a sole proprietor with no employees, you must organize your email, incoming messages and calendar so that you build a consistent flow of communication with your clients and associates. Financial accountability is tied directly to profitability. Organizing the billing process and collections, employee payroll, expenses and overhead bills is a function in business that cannot be ignored. You must exert organizational controls over the flow of money in and out of your business to know if you are turning a profit or heading for bankruptcy. Financial organization is just as vital in a large corporation dealing with a huge payroll and capital expenses as it is for a one-man operation if you want to provide a consistent income for you and your family. Organizational functions that fall on the leadership in your company include managing your income, staff, growth, planning and all the processes that lead to your profitability. The primary role of a manager is to organize the company so that the flow of work product, communication and financial accountability each interact appropriately and effectively. The leader or manager in a company coordinates all the other organized functions to make sure they are aligned to reach a common objective. Effective business leaders organize all the complex relationships involved in the business and ensure they complement and support each other as a cohesive unit.

ERP MARKET PLACE

SAP ERP is an enterprise resource planning software developed by the German company SAPSE. SAP ERP incorporates the key business functions of an organization. The latest version (SAP ERP 6.0) was made available in 2006. The most recent Enhancement Package (EHP8) for SAP ERP 6.0 was released in 2016. Business Processes included in SAP ERP are Operations (Sales&Distribution, Materials Management, Production Planning, Logistics Execution, and Quality Management), Financials (Financial Accounting, Management Accounting, Financial Supply Chain Management), Human Capital Management (Training, Payroll, e-Recruiting) and Corporate Services (Travel Management, Environment, Health and Safety, and Real-Estate Management). An ERP was built based on the former SAP R/3 software. SAP R/3, which was officially launched on 6 July 1992, consisted of various applications on top of SAP Basis, SAP's set of middleware programs and tools. All applications were built on top of the SAP Web Application Server. Extension sets were used to deliver new features and keep the core as stable as possible. The Web Application Server contained all the capabilities of SAP Basis. A complete architecture change took place with the introduction of mySAP ERP in 2004. R/3 Enterprise was replaced with the introduction of ERP Central Component (SAP ECC). The SAP Business Warehouse, SAP Strategic Enterprise Management and Internet Transaction Server were also merged into SAP ECC, allowing users to run them under one instance. The SAP Web Application Server was wrapped into SAP NetWeaver, which was introduced in 2003. Architectural changes were also made to support an enterprise service architecture to transition customers to a Service-oriented architecture. The latest version, SAP ERP 6.0, was released in 2006. SAP ERP 6.0 has since then been updated through SAP enhancement packs, the most recent: SAP enhancement package 8 for SAP ERP 6.0 in 2016. Top 20 List of ERP Software Companies NetSuite ERP. NetSuite was established in 1998 where it became one of the pioneer companies in cloud computing.

SYSPRO. First on the list of ERP software companies is SYSPRO. ...

Scoro. ...

Sage Intacct.

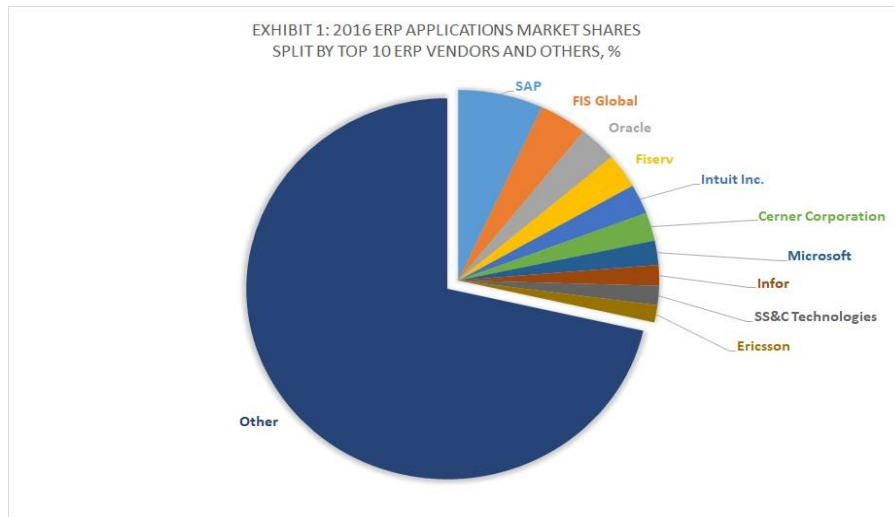
Brightpearl.

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\$82.2 billion in license, maintenance and subscription revenues. The ERP applications market includes both ERP Financial Management & ERP Services and Operations applications. PeopleSoft. In 2016, the top 10 ERP software vendors accounted for nearly 28.5% of the global ERP applications market which grew 1.4% to approach nearly. Last year SAP led the pack with nearly license, maintenance and subscription revenues. In 2016, FIS Global was No. 27% market share and \$5.6 billion in ERP product revenues, riding on a 4% jump in, followed by Oracle, Fiserv and Intuit in that order. In 2015, the standings of the top five were the same with SAP being No. 1, followed by FIS Global, Oracle, Fiserv and Intuit.



ERP Financial Management software covers finance-specific business processes such as accounts payable, accounts receivable, general ledger, and fixed asset accounting, as well as online functions such as invoicing, factoring, electronic payments and financial reporting. FM applications revenues represent a major contributor to the Enterprise Resource Planning market as part of our market sizing exercise. ERP Services and Operations Management covers integrated applications suites designed to automate a range of business processes from back-office operations to financial management and from sales order capture to customer information management. Currently ERP also covers functions not being addressed by other functional markets. Examples include Environment and Health and Safety, Governance, Risk and Compliance, as well as industry-specific applications for 21 verticals. Buoyed by NetSuite, Workday and Xero, the ERP FM market has never looked more promising, but incumbents are fighting back with quick conversion toolkits, GL upgrades and embedded analytics for easy reporting. Industry-specific ERP applications continue to exert considerable influence over direction of enterprise applications market, but growth remains muted because of entrenched presence of legacy systems.

BUSINESS MODULES IN THESE ERP PACKAGES

Enterprise Resource Planning System (ERP), just by considering name we can simply define ERP as System or software that used to manage all the resources of whole enterprise. Right from employee payments to single screw coming into the enterprise, everything can be managed & tracked by using ERP Systems. ERP is a cross functional software that supports all the business processes within the organization. In organization, ERP helps to manage business processes of various departments & functions through centralized application. We can make all the major decisions by screening the information provided by ERP. There are many vendors in market which are providing traditional ERP solutions or Cloud based ERP solutions. Though implementation platforms or technologies are

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different, there are common & basic modules of ERP which can be found in any ERP System. Depending on organizations need required components are integrated & customized ERP system is formed. All the below mentioned modules can be found in any ERP system:

- Human Resource
- Inventory
- Sales & Marketing
- Purchase
- Finance & Accounting
- Customer Relationship Management(CRM)
- Engineering/ Production
- Supply Chain Management (SCM)

Each component mentioned above is specialized to handle defined business processes of organization. Let us go through the introduction of the various modules.

Human Resource Module(HR):Human Resource module helps to HR team for efficient management of human resources. HR module helps to manage employee information, track employee records like performance reviews, designations, job descriptions, skill matrix, time & attendance tracking. One of the important sub module in HR module is Payroll System which helps to manage salaries, payment reports etc. It can also include Travel Expenses & Reimbursement tracking. Employee Training tracking can also be managed by ERP.

Inventory Module:Inventory module can be used to track the stock of items. Items can be identified by unique serial numbers. Using that unique numbers inventory system can keep track of item and trace its current location in organization.e.g. you have purchased 100 hard disk , so using inventory system you can track how many hard disks are installed , where they are installed, how many hard disks are remaining etc. Inventory module includes functionalities like inventory control, master units , stock utilization reporting etc. There may be integration of inventory module with purchase module of ERP.

Sales Module :Typical sales process includes processes like Sales queries & enquiry analysis & handling, quotation drafting, accepting sales orders, drafting sales invoices with proper taxation, dispatch/shipment of material or service, tracking pending sales order . All these sales transactions are managed by sales module of ERP. CRM module can take help of Sales module for future opportunity creation & lead generation.

Purchase Module: As name indicates, purchase modules take care of all the processes that are part of procurement of items or raw materials that are required for organization. Purchase module consists of functionalities like supplier/vendor listing, supplier & item linking, sending quotation request to vendors, receiving & recording quotations, analysis of quotations, preparing purchase orders, tracking the purchase items, preparing GRNs(Good Receipt Notes) & updating stocks & various reports . Purchase module is integrated with Inventory module & Engineering/production module for updating of stocks.

Finance & Accounting module: Whole inflow & outflow of money/capital is managed by finance module. This module keeps track of all account related transactions like expenditures, Balance sheet, account ledgers, budgeting, bank statements ,payment receipts, tax management etc. Financial reporting is easy task for this module of ERP. Any Financial data that is required for running business is available on one click in Finance module.

Customer Relationship Management (CRM) module: CRM department helps to boost the sales performance through better customer service & establishing the healthy relationship with customers. All the stored details of customer are available in CRM module. CRM module helps to manage & track detailed information of the customer

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like communication history ,calls, meetings, details of purchases made by customer, contract duration etc. CRM module can be integrated with Sales module to enhance sales opportunities.

Engineering / Production module: Production module is great help for manufacturing industry for delivering product. This module consist of functionalities like production planning, machine scheduling, raw material usage,(Bill of material)preparation, track daily production progress production forecasting & actual production reporting.

Supply Chain Management (SCM): SCM module manages the flow of product items from manufacturer to consumer & consumer to manufacturer. Common roles involved are manufacturer, Super Stockiest, Stockiest, distributors, retailers etc. SCM involves demand & supply management , sales returns & replacing process, shipping & transportation tracking etc. Today many SMBs face challenges in their process automation. ERP is the great help for such organizations. ERP can efficiently streamline the business operations of organization. Above introduction of modules can help you to choose & customize the ERP modules depending on your organizations requirements.

OVERVIEW OF KEY END TO END BUSINESS PROCESSES SUPPORTED IN TWO MAJOR ERP SYSTEMS

Each Scenario is built up of different process steps like Create or Maintain Customer, Enter and Authorize Sales Order and so on. More details to the scenarios are available in the SAP Business Maps. Each industry and each business adapts those scenarios and process steps to their own needs and uses those differences to gain an advantage to their competitors. Even if those business scenarios are published, the intrinsic knowledge or attitude of an organization cannot be easily copied and implemented by competitors (see also The World is Flat about Total Quality Management).A BPX must be familiar with the basic scenarios and be able to map them to the organizations specifics.Purpose– Enterprise integration endeavors are complex because they compel an organization to understand how its cross-organizational business processes are enabled by multiple systems. For any large-scale implementation project, specific business process and system information is included in the enterprise-solution architecture. To understand the totality of any organization's business processes, managers must define and document all core and support processes. Design/methodology/approach– The examples used in this paper are from large public sector organizations, but the underlying methodology and conceptual basis for the paper apply to any complex organization. Findings– The main conclusion of this paper is that end-to-end (E2E) business process scenarios must be used for defining the requirements for any system implementation project in any organization. If the new system does not align with the E2E-business processes, then management requirements cannot be realized. We also note that E2E scenarios must be considered when implementing enterprise software in a non-enterprise environment. Originality/value– The paper notes that E2E scenarios represent the requirements definition level for composite applications enabled in a service-oriented architecture (SOA). Traditional implementation methodologies that enable standard software modules (or integration scenarios across modules) are not effective in non-enterprise environments.

MODULE 5:EMERGING TRENDS AND FUTURE OF ERP SYSTEMS

SERVICE ORIENTED ARCHITECTURE (SOA):

A service-oriented architecture (SOA) is a style of software design where services are provided to the other components by application components, through a communication protocol over a network. The basic principles of service-oriented architecture are independent of vendors, products and technologies.¹A service is a discrete unit of functionality that can be accessed remotely and acted upon and updated independently, such as retrieving a credit card statement online. A service has four properties according to one of many definitions of SOA:

It logically represents a business activity with a specified outcome.

It is self-contained.

It is a black box for its consumers.

It may consist of other underlying services.¹

Different services can be used in conjunction to provide the functionality of a large software application, a principle it shares with modular programming. Service-oriented architecture integrates distributed, separately-maintained and deployed software components. It is enabled by technologies and standards that make it easier for components to communicate and cooperate over a network, especially an IP network. In SOA, services use protocols that describe how they pass and parse messages using description metadata. This metadata describes both the functional characteristics of the service and quality-of-service characteristics. Service-oriented architecture aims to allow users to combine large chunks of functionality to form applications which are built purely from existing services and combining them in an ad hoc manner. A service presents a simple interface to the requester that abstracts away the underlying complexity acting as a black box. Further users can also access these independent services without any knowledge of their internal implementation.

Defining concepts

The related buzzword service-orientation promotes *loose coupling* between services. SOA separates functions into distinct units, or services, which developers make accessible over a network in order to allow users to combine and reuse them in the production of applications. These services and their corresponding consumers communicate with each other by passing data in a well-defined, shared format, or by coordinating an activity between two or more services. A manifesto was published for service-oriented architecture in October, 2009. This came up with six core values ,Business value is given more importance than technical strategy, Strategic goals are given more importance than project-specific benefits, Intrinsic inter-operability is given more importance than custom integration, Shared services are given more importance than specific-purpose implementations, Flexibility is given more importance than optimization, Evolutionary refinement is given more importance than pursuit of initial perfection, SOA can be seen as part of the continuum which ranges from the older concept of distributed computing, and modular programming, through SOA, and on to current practices of mashups, SaaS, and cloud computing (which some see as the offspring of SOA).

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Principles

There are no industry standards relating to the exact composition of a service-oriented architecture, although many industry sources have published their own principles. Some of these include the following:

Standardized service contract Services adhere to a standard communications agreements, as defined collectively by one or more service-description documents within a given set of services. Service reference autonomy (an aspect of loose coupling) The relationship between services is minimized to the level that they are only aware of their existence. Service location transparency (an aspect of loose coupling) Services can be called from anywhere within the network that it is located no matter where it is present. Service longevity Services should be designed to be long lived. Where possible services should avoid forcing consumers to change if they do not require new features, if you call a service today you should be able to call the same service tomorrow. Service abstraction .The services act as black boxes, that is their inner logic is hidden from the consumers. Service autonomy .Services are independent and control the functionality they encapsulate, from a Design-time and a run-time perspective. Services are stateless, that is either return the requested value or give an exception hence minimizing resource use. Service granularity ,A principle to ensure services have an adequate size and scope. The functionality provided by the service to the user must be relevant. It creates a web service and provides its information to the service registry. Each provider debates upon a lot of hows and whys like which service to expose, which to give more importance: security or easy availability, what price to offer the service for and many more. The provider also has to decide what category the service should be listed in for a given broker service^[6] and what sort of trading partner agreements are required to use the service. Service broker, service registry or service repository .Its main functionality is to make the information regarding the web service available to any potential requester. Whoever implements the broker decides the scope of the broker. Public brokers are available anywhere and everywhere but private brokers are only available to a limited amount of public. UDDI was an early, no longer actively supported attempt to provide Web services discovery.

Service requester/consumer

It locates entries in the broker registry using various find operations and then binds to the service provider in order to invoke one of its web services. Whichever service the service-consumers need, they have to take it into the brokers, bind it with respective service and then use it. They can access multiple services if the service provides multiple services. The service consumer-provider relationship is governed by a standardized service contract, which has a business part, a functional part and a technical part. Service composition patterns have two broad, high-level architectural styles: choreography and orchestration. Lower level enterprise integration patterns that are not bound to a particular architectural style continue to be relevant and eligible in SOA design.

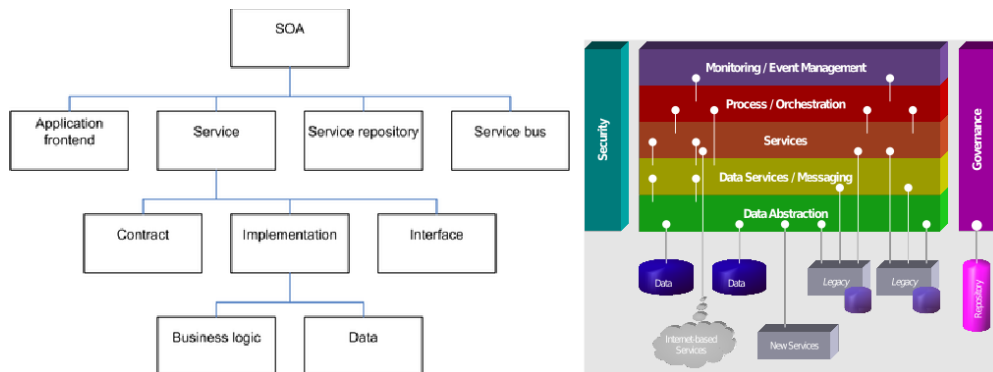
Implementation approaches

Service-oriented architecture can be implemented with Web services. This is done to make the functional building-blocks accessible over standard Internet protocols that are independent of platforms and programming languages. These services can represent either new applications or just wrappers around existing legacy systems to make them network-enabled. Implementers commonly build SOAs using web services standards. One example is SOAP, which has gained broad industry acceptance after recommendation of Version 1.2 from the W3C¹ (World Wide Web Consortium) in 2003. These standards (also referred to as web service specifications) also provide greater interoperability and some protection from lock-in to proprietary vendor software. One can, however, also implement SOA using any other service-based technology, such as Jini, CORBA or REST.

Implementations can use one or more of these protocols and, for example, might use a file-system mechanism to communicate data following a defined interface specification between processes conforming to the SOA concept. The key is independent services with defined interfaces that can be called to perform their tasks in a standard way,

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without a service having foreknowledge of the calling application, and without the application having or needing knowledge of how the service actually performs its tasks. SOA enables the development of applications that are built by combining loosely coupled and interoperable services. These services inter-operate based on a formal definition (or contract, e.g., WSDL) that is independent of the underlying platform and programming language. The interface definition hides the implementation of the language-specific service. SOA-based systems can therefore function independently of development technologies and platforms (such as Java, .NET, etc.). Services written in C# running on .NET platforms and services written in Java running on Java EE platforms, for example, can both be consumed by a common composite application (or client). Applications running on either platform can also consume services running on the other as web services that facilitate reuse. Managed environments can also wrap COBOL legacy systems and present them as software services. High-level programming languages such as BPEL and specifications such as WS-CDL and WS-Coordination extend the service concept by providing a method of defining and supporting orchestration of fine-grained services into more coarse-grained business services, which architects can in turn incorporate into workflows and business processes implemented in composite applications or portals. Service-oriented modeling is an SOA framework that identifies the various disciplines that guide SOA practitioners to conceptualize, analyze, design, and architect their service-oriented assets. The Service-oriented modeling framework (SOMF) offers a modeling language and a work structure or "map" depicting the various components that contribute to a successful service-oriented modeling approach. It illustrates the major elements that identify the "what to do" aspects of a service development scheme. The model enables practitioners to craft a project plan and to identify the milestones of a service-oriented initiative. SOMF also provides a common modeling notation to address alignment between business and IT organizations.



Elements of SOA, by Dirk Krafzig, Karl Banke, and Dirk Slama

Organizational benefits

Some enterprise architects believe that SOA can help businesses respond more quickly and more cost-effectively to changing market conditions.¹ This style of *architecture* promotes reuse at the macro (service) level rather than micro (classes) level. It can also simplify interconnection to—and usage of—existing IT (legacy) assets. With SOA, the idea is that an organization can look at a problem holistically. A business has more overall control. Theoretically there would not be a mass of developers using whatever tool sets might please them. But rather they would be coding to a standard that is set within the business. They can also develop enterprise-wide SOA that encapsulates a business-oriented infrastructure. SOA has also been illustrated as a highway system providing efficiency for car drivers. The point being that if everyone had a car, but there was no highway anywhere, things would be limited and disorganized, in any attempt to get anywhere quickly or efficiently. IBM Vice President of Web Services Michael Liebow says that SOA "builds highways". In some respects, SOA could be regarded as an architectural evolution rather than as a revolution. It captures many of the best practices of previous software architectures. In communications systems, for example, little development of solutions that use truly static bindings to talk to other equipment in the network has taken place. By embracing a SOA approach, such systems can position themselves to

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stress the importance of well-defined, highly inter-operable interfaces. Other predecessors of SOA include Component-based software engineering and Object-Oriented Analysis and Design (OOAD) of remote objects, for instance, in CORBA. A service comprises a stand-alone unit of functionality available only via a formally defined interface. Services can be some kind of "nano-enterprises" that are easy to produce and improve. Also services can be "mega-corporations" constructed as the coordinated work of subordinate services. A mature rollout of SOA effectively defines the API of an organization. Reasons for treating the implementation of services as separate projects from larger projects include: Separation promotes the concept to the business that services can be delivered quickly and independently from the larger and slower-moving projects common in the organization. The business starts understanding systems and simplified user interfaces calling on services. This advocates agility. That is to say, it fosters business innovations and speeds up time-to-market. Separation promotes the decoupling of services from consuming projects. This encourages good design insofar as the service is designed without knowing who its consumers are. Documentation and test artifacts of the service are not embedded within the detail of the larger project. This is important when the service needs to be reused later. SOA promises to simplify testing indirectly. Services are autonomous, stateless, with fully documented interfaces, and separate from the cross-cutting concerns of the implementation. If an organization possesses appropriately defined test data, then a corresponding stub is built that reacts to the test data when a service is being built. A full set of regression tests, scripts, data, and responses is also captured for the service. The service can be tested as a 'black box' using existing stubs corresponding to the services it calls. Test environments can be constructed where the primitive and out-of-scope services are stubs, while the remainder of the mesh is test deployments of full services. As each interface is fully documented with its own full set of regression test documentation, it becomes simple to identify problems in test services. Testing evolves to merely validate that the test service operates according to its documentation, and finds gaps in documentation and test cases of all services within the environment. Managing the data state of idempotent services is the only complexity. Examples may prove useful to aid in documenting a service to the level where it becomes useful. The documentation of some APIs within the Java Community Process provides good examples. As these are exhaustive, staff would typically use only important subsets. The 'ossjsa.pdf' file within JSR-89 exemplifies such a file.¹

Criticism

SOA has been conflated with Web services; however, Web services are only one option to implement the patterns that comprise the SOA style. In the absence of native or binary forms of remote procedure call (RPC), applications could run more slowly and require more processing power, increasing costs. Most implementations do incur these overheads, but SOA can be implemented using technologies (for example, Java Business Integration (JBI), Windows Communication Foundation (WCF) and data distribution service (DDS)) that do not depend on remote procedure calls or translation through XML. At the same time, emerging open-source XML parsing technologies (such as VTD-XML) and various XML-compatible binary formats promise to significantly improve SOA performance. Services implemented using JSON instead of XML do not suffer from this performance concern. Stateful services require both the consumer and the provider to share the same consumer-specific context, which is either included in or referenced by messages exchanged between the provider and the consumer. This constraint has the drawback that it could reduce the overall scalability of the service provider if the service-provider needs to retain the shared context for each consumer. It also increases the coupling between a service provider and a consumer and makes switching service providers more difficult.¹ Ultimately, some critics feel that SOA services are still too constrained by applications they represent. A primary challenge faced by service-oriented architecture is managing of metadata. Environments based on SOA include many services which communicate among each other to perform tasks. Due to the fact that the design may involve multiple services working in conjunction, an Application may generate millions of messages. Further services may belong to different organizations or even competing firms creating a huge trust issue. Thus SOA governance comes into the scheme of things. Tim O'Reilly coined the term "Web 2.0" to describe a perceived, quickly growing set of web-based applications.¹ A topic that has experienced extensive coverage involves the relationship between Web 2.0 and service-oriented architectures. SOA is the philosophy of encapsulating application logic in services with a uniformly defined interface and making these

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publicly available via discovery mechanisms. The notion of complexity-hiding and reuse, but also the concept of loosely coupling services has inspired researchers to elaborate on similarities between the two philosophies, SOA and Web 2.0, and their respective applications. Some argue Web 2.0 and SOA have significantly different elements and thus cannot be regarded "parallel philosophies", whereas others consider the two concepts as complementary and regard Web 2.0 as the global SOA. The philosophies of Web 2.0 and SOA serve different user needs and thus expose differences with respect to the design and also the technologies used in real-world applications. However, as of 2008, use-cases demonstrated the potential of combining technologies and principles of both Web 2.0 and SOA.

Micro services

Microservices are a modern interpretation of service-oriented architectures used to build distributed software systems. Services in a microservice architecture are processes that communicate with each other over the network in order to fulfill a goal. These services use technology agnostic protocols, which aid in encapsulating choice of language and frameworks, making their choice a concern internal to the service. Microservices are a new realisation and implementation approach to SOA, which have become popular since 2014 (and after the introduction of DevOps), and which also emphasize continuous deployment and other agile practices.

There is no single commonly agreed definition of microservices. The following characteristics and principles can be found in the literature:

- fine-grained interfaces (to independently deployable services),
- business-driven development (e.g. domain-driven design),
- IDEAL cloud application architectures,
- polyglot programming and persistence,
- lightweight container deployment,
- decentralized continuous delivery, and
- DevOps with holistic service monitoring.

FUTURE OF ERP TECHNOLOGIES:

As high-end technological advancements continue to emerge at warp-speed, it is imperative for businesses to walk hand-in-hand with the change and embrace novel technologies to stay ahead in the game. A number of factors are deemed to shaping up the future of ERP solutions in India and globally, this blog will discuss about few prominent ones that we at Sage Software Solutions Pvt. Ltd. believe will play a pivotal role in revolutionizing the ERP technology by and its use businesses. Tomorrow's ERP technology hints at fortifying the ability of businesses to make, CRM and payroll solutions to SMEs across India, we thought of it as an interesting more informed decisions and indulge in smart business. Being a leading provider of ERP thing to predict where the industry might take us in five years down the line, say by 2020. Though it's still several years from now, here are few predictions for ERP that will define what the technology will look like by 2020.

More user-friendly ERP systems

With increased influx of next-gen workforce in organisations, we are sure to see a huge number of highly user-friendly ERP systems to come up in the near future. Imagine a youth in his 20s hailing from the Twitter and Facebook era is being asked to understand and work on some primitive and pale dashboard-based ERP system, it is just not going to happen! Thus, businesses that are yet to make the big switch will be under acute pressure to do so. To counteract this dilemma, ERP vendors are expected to come up with more agile, intuitive and user-friendly ERP solutions to accommodate the next-gen workforce. Looking at this, Sage Software has rolled out Sage X3, a modern and cutting-edge ERP software with attractive dashboard, easy to use feature and mobile. Coming to wearable technology, smart watches, glasses, bands, etc. would form the crux for ERP anytime, anywhere!

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Mobility and wearable technology to turn dominant

Whilst industry experts stress more on cloud and SaaS, mobility will be a primary dominant in the ERP market by 2020. Right from store personnel to management people and clerks to back-office employees, everyone is expected to access ERP systems via mobile devices instead of desktops. This is because more and more number of folks are used to handheld devices in their personal lives thus, would prefer using ERP systems from their mobile devices even when on the go! So unmatched flexibility through mobile ERP is just around the corner! Brace yourself for the **mobile ERP era** .

Improved BI and reporting

Though business intelligence has already gained a decent traction, it is expected to continue trending over the coming years. Having intuitive and actionable business data handy via BI reporting, businesses will find it easy to maneuver critical operations and strategies accordingly. Thus, the need for robust ERP software with accurate business intelligence reporting will grow in great numbers. So watch out for the BI buzzword in the near future.

Upsurge in bespoke ERP solution

Since we are already witnessing a surge in businesses that do not necessarily ask for a full-fledge ERP software, but instead want a fully customized ERP solution that befits specific business needs such as ERP for inventory tracking, accounting software solutions, warehouse management, sales/purchase etc. So in the next few years, we expect a steep upsurge in businesses that would demand for bespoke ERP solutions befitting specific business preferences and requisites.

Conclusion:

It certainly will be amazing to recall these predictions after five years to ascertain as which ones made to the list and which ones went off track. Nevertheless, basis of trends that we at Sage Software are witnessing, these aforementioned ones seem quite relevant