E-COMMERCE WITH THE 5-C MODEL

The 5-C model is a framework commonly used in e-commerce to analyze and optimize various aspects of online businesses. Each "C" represents a different component that contributes to the success of an e-commerce venture. Here's a breakdown of the 5-Cs:

1. Commerce: This refers to the actual transactions that take place on your e- commerce platform. It involves the design and functionality of your website or app, as well as the checkout process, payment gateways, and order management systems. A user-friendly and secure commerce experience is essential for converting visitors into customers.

2. Collaboration: Collaboration in e-commerce can refer to partnerships with other businesses, influencers, or affiliates to expand your reach and attract new customers. It could involve co-marketing efforts, joint promotions, or cross-selling arrangements. By collaborating with relevant stakeholders, you can tap into new audiences and drive more traffic to your e-commerce platform.

3. Communication: Effective communication is a key to attracting and retaining customers. This includes email marketing, social media engagement, live chat support, and other channels for interacting with customers. Personalized communication tailored to the needs and preferences of your audience can help drive engagement and sales.

4. Connection: Connection emphasizes the importance of building meaningful relationships with customers. This goes beyond transactional interactions to create
a sense of community and loyalty. You can foster connections through loyalty programs, user-generated content, online communities, and personalized recommendations. Building strong connections can lead to increased customer retention and advocacy.

5. Computation: Computation may refer to leveraging data and technology to optimize various aspects of your e-commerce operations. This includes data analytics, Al-driven personalization, recommendation engines, inventory management systems, and predictive analytics. By harnessing the power of computation, you can gain valuable insights into customer behavior, streamline processes, and enhance the overall shopping experience.

By integrating these components into your e-commerce strategy, you can create a holistic approach that focuses on driving sales, fostering collaboration, facilitating communication, building connections, and leveraging technology to stay ahead in the competitive e-commerce landscape.

BUSINESS MODELS RELATED TO E-COMMERCE

Types of E-Commerce

Based on the services offered, there are several types of ecommerce models that have been developed over the years. The major categorization is based on the customers and the seller. Each of these types has different features and attributes. Some of the important models of e-commerce are as follows:

1. Business to Business (B2B)

B2B e-commerce refers to buying, transferring, or exchanging products, services, and/or information between two or more business entities over the internet. This model can cover an array of capabilities to help any size business operate to its fullest capacity.
It is one of the most valuable models of e-commerce that helps companies to form electronic relationships with each other such as manufacturers selling to distributors and wholesalers selling to retailers through the internet via an online sales portal. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to final customer who comes to buy the product at the wholesaler's retail outlet.

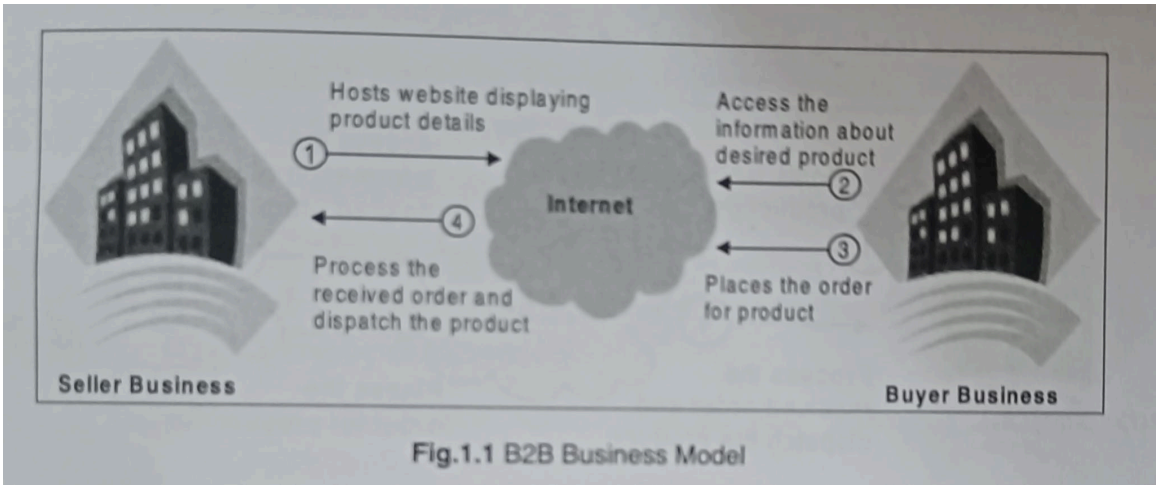


Fig.1.1 B2B Business Model

The benefits of B2B are:

Efficiency: B2B e-commerce streamlines procurement processes, reducing manual tasks and paperwork.

Cost Savings: Lower transaction costs, fewer errors, and optimized inventory management lead to cost savings.

Expanded Reach: Access to a wider range of suppliers and customers globally increases market reach.

Personalization: Tailored pricing, catalogs, and account management enhance customer experience and loyalty.

Data Insights: Advanced analytics provide valuable insights into purchasing patterns and trends.

Scalability: B2B e-commerce platforms can easily scale to accommodate growing business needs.

24/7 Availability: Online platforms offer round-the-clock access to products and services, improving convenience.

Competitive Advantage: Adopting B2B e-commerce can differentiate businesses and position them competitively in the market.

2. Business to Consumer (B2C)

The B2C Model of E-Commerce is a model in which businesses sell products and services directly to the customer. It refers to methods by which companies connect, communicate and conduct business transactions directly with products (such as the internet. B2C is larger than just online retailing; it includes tangible products (such as electronic gazettes etc.) and intangible products such as online banking, travel service online auctions, stock trading, health and real estate sites.

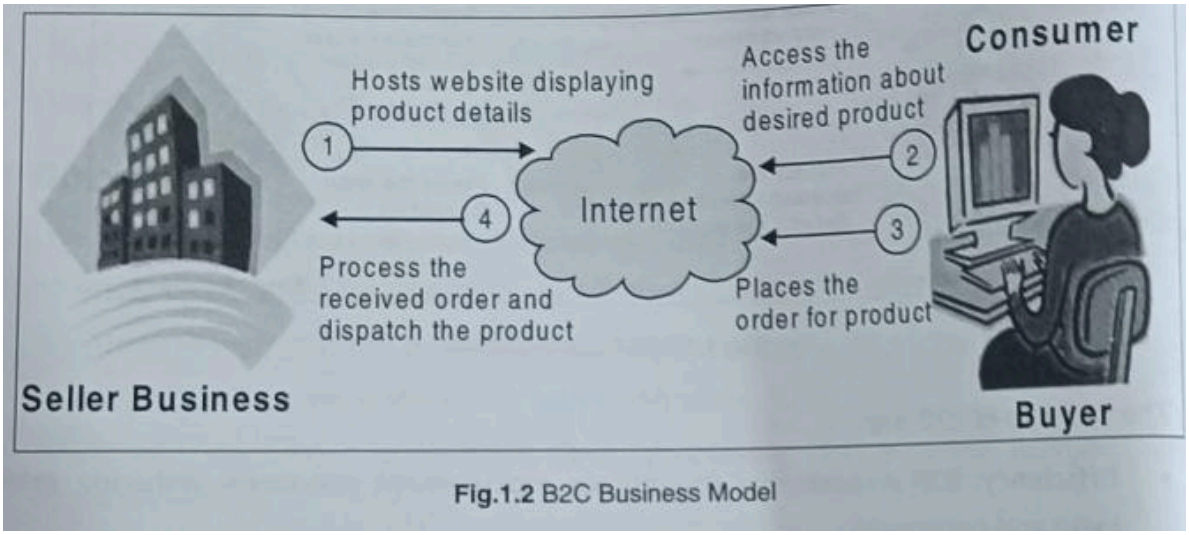


Fig.1.2 B2C Business Model

The B2C model focuses on direct selling and marketing between a business and a consumer via an e-commerce website. For this, the company designs and places a web site on the internet. The company's web site publishes all details about the product and services and that benefits customers to place orders for these goods from the web site. A lower purchase volume of higher priced products typically characterizes B2C companies. As the model depends on individual transactions and eliminates the wholesale purchaser, the company can make a higher profit while the consumer spends the same amount of money or sometimes less. B2C is effective for smaller companies since individual consumers are not as concerned with company recognition as they are with getting the product for the best price

The benefits of B2C are:

Convenience: Customers can shop anytime, anywhere, without the constraints of store hours or location.

Wide Product Selection: Access to a vast array of products and services from multiple vendors enhances choice

Competitive Pricing: Online competition often leads to competitive pricing and better deals for consumers.

Personalized Experience: Recommendations, tailored promotions, and personalized shopping experiences cater to individual preferences.

Ease of Comparison: Customers can easily compare prices, features, and reviews across different brands and products.

Convenient Delivery Options: Flexible delivery options, including same-day or next-day delivery, improve convenience.

Accessibility: E-commerce platforms are accessible to people with disabilities, enhancing inclusivity.

No Geographical Boundaries: Customers can shop from anywhere in the world. breaking down geographical barriers.

Ease of Returns: Hassle-free return policies and processes increase customer confidence and satisfaction.

3. Consumer to Consumer (C2C)

The C2C model of e-commerce is a model in which a consumer sells products and/or services directly to another consumer. It is a business model where two individuals transact or conduct business with each other directly.

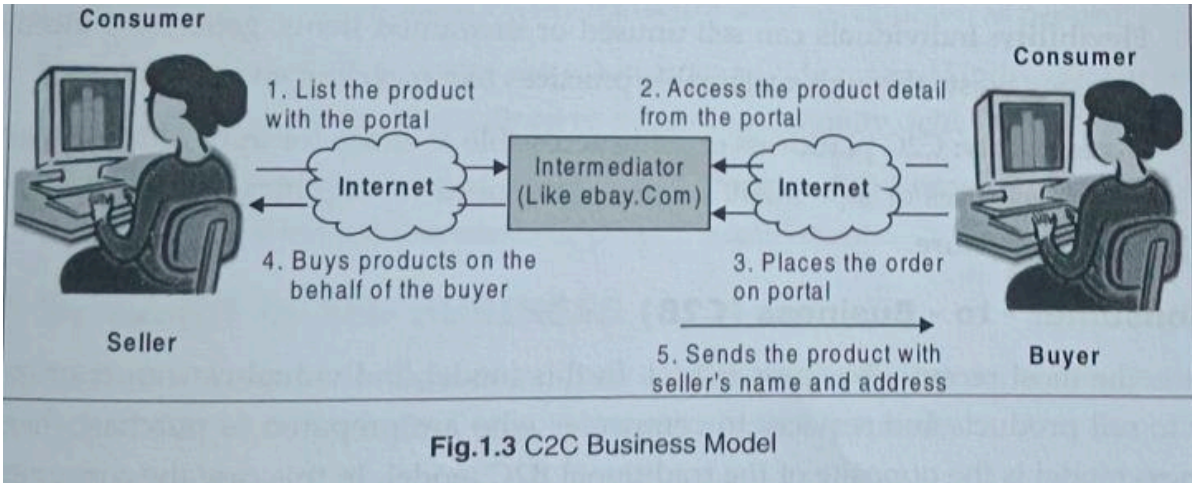


Fig.1.3 C2C Business Model

Generally an intermediary/third party (in the form of a website) may be involved, but the purpose of the intermediary is only to facilitate the transaction and provide a platform for the people to connect. The intermediary may or may not receive a fee or commission, but is not responsible for the products exchanged.
C2C normally takes the form of an auction where the bidding is done online. Ebay.com and Amazon.com are the most notable sites performing such actions. EBay is a top auction site where individuals can list goods for customers to bid on. These C2C facilitators earn fees or commissions by allowing sellers to list and sell goods through their websites. C2C reduces the cost with the similar interest consumers interact directly, thus eliminating the need of a physical store. C2C can also take the form of virtual communities where people who share the same interests interact with each other and share ideas.

In the C2C business model, the intermediary website helps consumers to sell their assets like residential property, cars, motorcycles, mobile etc. by publishing their information on the website. Website may or may not charge the consumer for its services. Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.

The benefits of C2C E-commerce are as follows:

Diverse Product Selection: C2C platforms offer a wide range of products, including unique and niche items not commonly found in traditional retail stores.

Affordability: Competitive pricing among individual sellers often results in lower prices compared to traditional retail outlets.

Community Engagement: C2C platforms foster community interaction, allowing buyers and sellers to engage, share experiences, and build trust through user ratings and reviews.

Flexibility: Individuals can sell unused or unwanted items, generating income and reducing waste through sustainable practices like recycling and reusing.

Accessibility: C2C platforms provide accessible avenues for individuals to start their own businesses or side hustles without the need for significant upfront investment or infrastructure.

4. Consumer - to - Business (C2B)

It is the most recent e-business model. In this model, individual consumers or end users offer to sell products and services to companies who are prepared to purchase them. This business model is the opposite of the traditional B2C model. In this case the consumer is the seller and the business organization is the buyer. The idea is that the individual/end user provides a product or service that the business can use to complete a business process or gain competitive advantage. For example, www.naukri.com is a Web site on which a consumer can post his bio-data for the services he can offer. Any business organization that is interested in deploying the services of the consumer can contact him and then employ him, if suitable.

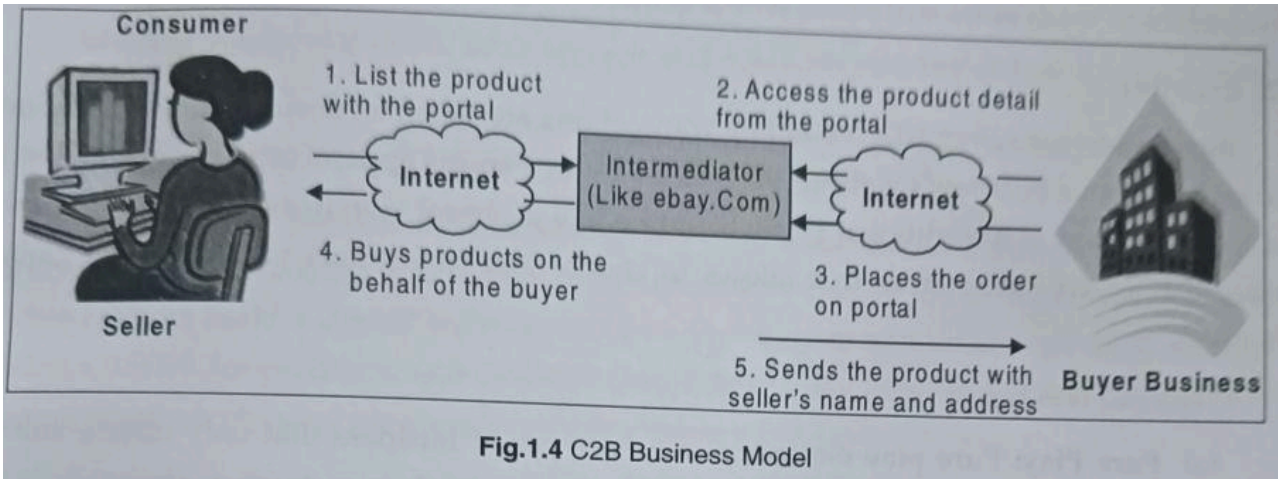


Fig.1.4 C2B Business Model

The benefits of C2B E-commerce are as follows:

Innovation: C2B models harness the creativity and expertise of individuals, allowing businesses to tap into a diverse pool of talent and ideas.

Cost-Effectiveness: Businesses can access specialized services or content without the overhead costs associated with hiring full-time employees or maintaining in-house teams.

Flexibility: C2B arrangements offer flexibility in sourcing talent or content on a project-by-project basis, allowing businesses to scale up or down as needed.

Quality Assurance: Businesses can select from a wide range of individual providers, leveraging user reviews and ratings to ensure high-quality deliverables.

Speed: C2B transactions often result in faster turnaround times as individuals can quickly respond to business needs or project requirements.

B2C BUSINESS AND CRM

Customer Relationship Management (CRM) is a strategy and technology used by businesses to manage interactions with current and potential customers. It involves collecting and analyzing customer data to improve relationships, increase sales, and drive business growth. CRM systems centralize customer information, automate processes, and facilitate personalized marketing and customer service. By providing a comprehensive view of each customer and streamlining interactions, CRM helps businesses enhance customer satisfaction, loyalty, and retention.

Typical CRM process

The typical CRM process involves following key steps:

1. Data Collection: Gather customer information from various sources including interactions, purchases, and demographics.
2. Data Organization: Centralize and store collected data in a CRM database for easy access and management.
3. Data Analysis: Analyze customer data to identify trends, behaviors, and preferences.
4. Strategy Development: Develop personalized engagement strategies based on data insights to target specific customer segments.
5. Customer Engagement: Engage with customers through personalized interactions via email, social media, and other channels.
6. Feedback Collection: Collect feedback from customers through surveys, reviews, and other feedback mechanisms.
7. Performance Monitoring: Monitor key performance indicators (KP'ls) related to customer engagement, satisfaction, and retention.
8. Iterative Improvement: Continuously refine CRM strategies based on feedback and performance data to optimize customer relationships and business outcomes.

Benefits of CRM to B2C

B2C businesses utilize Customer Relationship Management (CRM) systems to manage interactions with their customers and optimize the overall customer experience. Here's how CRM is beneficial for B2C businesses:

- Customer Data Centralization: CRM systems gather and centralize customer data from various touchpoints, including website visits, social media interactions, purchase history, and customer service inquiries. This centralized database provides a comprehensive view of each customer, enabling businesses to personalize interactions and tailor marketing efforts accordingly.
- Personalized Marketing: With access to detailed customer profiles and preferences, B2C businesses can create personalized marketing campaigns and offers. CRM systems facilitate targeted email marketing, product recommendations, and promotions based on individual customer behaviors and interests, increasing the effectiveness of marketing efforts and driving sales.
- Improved Customer Service: CRM platforms streamline customer service processes by providing agents with access to relevant customer information and interaction history. This enables agents to

respond quickly to inquiries, address customer issues more effectively, and provide personalized support, ultimately enhancing customer satisfaction and loyalty.

- Automation and Efficiency: CRM systems automate repetitive tasks such as data entry, email responses, and follow-up communications, freeing up time for employees to focus on more strategic activities. Automated workflows ensure consistency in customer interactions and help businesses scale their operations efficiently as they grow.
- Sales Pipeline Management: CRM software enables B2C businesses to manage their sales pipeline more effectively by tracking leads, opportunities, and conversions. Sales teams can prioritize leads, track interactions, and forecast sales performance, leading to more efficient sales processes and improved revenue generation.
- Customer Segmentation and Targeting: CRM systems allow businesses to segment their customer base based on demographics, behaviors, and purchase history. By understanding different customer segments, businesses can tailor marketing messages, offers, and product recommendations to specific audience groups, increasing relevance and engagement.
- Feedback Management: CRM platforms facilitate the collection and analysis of customer feedback through surveys, reviews, and social media interactions Businesses can use this feedback to identify areas for improvement, address customer concerns, and enhance the overall customer experience.
- Measurement and Analytics: CRM systems provide robust reporting and analytics capabilities, allowing businesses to track key performance metrics such as customer acquisition costs, customer lifetime value, and customer satisfaction scores. By monitoring these metrics, businesses can identify trends, measure the effectiveness of their strategies, and make data-driven decisions to optimize performance.

B2C SOFTWARE SYSTEM

Online Shop

An online shop, as a Business-to-Consumer (B2C) software system, is a digital platform designed to facilitate the buying and selling of products or services directly to consumers over the internet.

The components of an online shop include:

E-commerce Platform: The foundation of the online shop, providing the interface for customers to browse and purchase products.

Product Catalog: A database containing detailed information about available products, including descriptions, images, prices, and specifications.

Shopping Cart: A feature that allows customers to add products to a virtual cart for purchase, review their selections, and proceed to checkout.

Checkout Process: A series of steps where customers enter their shipping and payment information to complete the purchase. This typically includes secure payment processing and order confirmation.

User Accounts: Optional accounts for customers to create profiles, view order history, track shipments, and manage preferences.

Search and Filtering: Tools to help customers quickly find products by searching keywords or using filters based on categories, price range, brand, etc.

Customer Reviews and Ratings: Features that enable customers to leave feedback and ratings for products, helping other shoppers make informed purchasing decisions.

Shipping and Delivery Options: Information about shipping methods, delivery times, and associated costs, along with tracking capabilities for orders in transit

Promotions and Discounts: Offers such as coupons, discounts, and promotional codes to incentivize purchases and reward loyal customers.

Customer Support: Channels for customer assistance, including live chat, email, and phone support, to address inquiries, resolve issues, and provide assistance throughout the shopping process.

Security Measures: Implementations such as SSL encryption, secure payment gateways, and data protection protocols to safeguard customer information and ensure secure transactions.

Mobile Responsiveness: Optimization of the online shop for mobile devices to provide a seamless shopping experience across different screen sizes and platforms.

Procurement Platform

In a Business-to-Consumer (B2C) context, a procurement platform serves as a digital marketplace where individual consumers can browse, select, and purchase products or services directly from suppliers or vendors. Unlike traditional e-commerce platforms where businesses sell to consumers, a procurement platform focuses on facilitating transactions between consumers and suppliers. Here's how it typically functions:

Supplier Listings: The platform aggregates listings from various suppliers, showcasing their products or services along with relevant details such as descriptions, prices, and availability.

Consumer Search and Selection: Consumers can search for specific items or browse through categories to find products or services that meet their needs. They can compare offerings from different suppliers and select the ones they wish to purchase.

Order Placement and Processing: Once consumers have chosen the desired items, they can add them to their cart and proceed to checkout. The platform facilitates. secure payment processing and order confirmation, ensuring a smooth transaction experience.

Supplier Management: The platform manages relationships with suppliers, handling tasks such as onboarding, contract negotiations, and performance monitoring. This ensures that consumers have access to reputable suppliers offering high-quality products or services.

Customer Support: Consumers can access customer support channels provided by the platform to seek assistance with inquiries, issues, or post-purchase support. This may include live chat, email, or phone support.

User Accounts: Optional user accounts allow consumers to create profiles, track order history, manage preferences, and receive personalized recommendations. This enhances the shopping experience and promotes customer loyalty.

Analytics and Reporting: The platform may offer analytics tools to track key performance metrics such as sales, customer satisfaction, and supplier performance. This data helps identify trends, optimize operations, and make informed business decisions.

Customer Relationship Management (CRM)

CRM, or Customer Relationship Management, is a business strategy and technology that helps companies manage interactions and relationships with their customers. It involves collecting and organizing customer data from various channels like emails, phone calls, social media, and purchases. CRM systems centralize this information in one place, providing businesses with a comprehensive view of each customer. With CRM, businesses can personalize their interactions, tailor marketing efforts, and improve customer service. It also helps in lead management, tracking sales opportunities, and forecasting future sales. By analyzing customer data and behaviors, CRM enables businesses to make informed decisions, enhance customer satisfaction, and ultimately drive growth. It's all about building strong, lasting relationships with customers and delivering exceptional experiences at every touchpoint.

Functions of CRM

Customer Relationship Management (CRM) serves various functions within a business to help manage interactions with customers effectively. Here are some key functions of CRM:

Centralized Customer Data: CRM systems gather and centralize customer information from multiple sources, including sales, marketing, customer service, and social media interactions. This centralized database provides a comprehensive view of each customer, facilitating personalized interactions and targeted marketing efforts.

Customer Segmentation: CRM allows businesses to segment their customer base into different groups based on demographics, behaviors, preferences, or other criteria. This segmentation enables businesses to tailor their marketing campaigns, communication strategies, and product offerings to specific customer segments.

Lead Management: CRM systems help businesses manage leads through the sales pipeline, from initial contact to conversion. This includes lead tracking, scoring. assignment, and nurturing to ensure timely follow-up and maximize conversion rates.

Sales Automation: CRM automates various sales-related tasks, such as data entry, lead qualification, and opportunity management. Automated workflows streamline sales processes, improve efficiency, and ensure consistency in customer interactions.

Marketing Automation: CRM platforms offer marketing automation capabilities, including email marketing, campaign management, and lead nurturing. Businesses can create and automate targeted marketing campaigns based on customer data and behaviors, driving engagement and conversion.

Customer Service and Support: CRM systems facilitate efficient customer service by providing agents with access to customer information, interaction history, and case management tools. This enables faster response times, personalized support, and effective issue resolution.

Analytics and Reporting: CRM software provides analytics tools to track key performance metrics, such as sales pipeline velocity, conversion rates, customer satisfaction scores, and marketing ROI. Reporting capabilities help businesses measure the effectiveness of their CRM strategies and make data-driven decisions.

Customer Feedback Management: CRM systems facilitate the collection and analysis of customer feedback through surveys, reviews, and social media interactions. This feedback provides valuable insights into customer satisfaction levels, product/service improvements, and areas for enhancement.

B2B SOFTWARE SYSTEM

Enterprise Resource Planning(ERP)

Enterprise resource planning (ERP) refers to software systems that integrate various business functions and processes into a unified system. These systems typically cover areas such as finance, human resources, supply chain management, manufacturing, and customer relationship management. ERP software allows organizations to streamline operations, improve efficiency, and gain better insights into their business processes by providing a centralized database and a unified interface for managing different aspects of the business.

ERP systems are designed to automate and optimize business processes, leading to better coordination between departments, improved decision-making, and increased productivity. They can also help organizations standardize processes across different locations or subsidiaries, ensure regulatory compliance, and enhance collaboration among employees.

Popular ERP vendors include SAP, Oracle, Microsoft Dynamics, and Infor, among others. The implementation of ERP systems can be complex and resource-intensive, requiring careful planning, customization, and training to ensure successful adoption within an organization.

Functions of ERP

The key functions of ERP are:.

Integration: ERP systems integrate various business processes and functions into a single system, ensuring data consistency and eliminating the need for separate systems for different departments.

Centralized Database: ERP provides a centralized database where all relevant data is stored, allowing for easier access, retrieval, and analysis of information across the organization.
Automation: ERP automates routine tasks and processes, reducing manual effort and human error while improving efficiency and accuracy.
Streamlined Operations: ERP streamlines operations by providing standardized processes and workflows, enabling better coordination between departments and facilitating smoother business operations.
Financial Management: ERP includes modules for managing financial processes such as accounting, budgeting, billing, and financial reporting, providing organizations with better visibility and control over their finances.
Supply Chain Management: ERP systems help manage the entire supply chain process, from procurement and inventory management to production planning and distribution, ensuring timely delivery of products and services.
Human Resources Management: ERP includes modules for managing HR processes such as payroll, benefits administration, employee records, and performance management, helping organizations effectively manage their workforce.
Customer Relationship Management: ERP systems often include CRM modules for managing customer interactions, sales, marketing, and customer service, allowing organizations to better understand and serve their customers.
Reporting and Analytics: ERP provides tools for generating reports and performing analytics on business data, enabling organizations to gain insights into their operations, identify trends, and make informed decisions.
Scalability: ERP systems are designed to scale with the growth of the organization, allowing them to accommodate increasing volumes of data, users, and transactions over time.

These functions collectively help organizations improve efficiency, reduce costs, enhance decision-making, and gain a competitive edge in the marketplace.

Supply Chain Management (SCM)

Supply chain management (SCM) encompasses the planning and execution of all activities involved in the sourcing, procurement, conversion, and logistics management of goods and services. Its aim is to create value for customers and stakeholders while optimizing the use of resources across the entire supply chain. Effective SCM requires collaboration, innovation, and the use of technology to streamline processes, reduce costs, and enhance customer satisfaction throughout the supply chain.

Functions of SCM

The functions of supply chain management (SCM) involve a variety of interconnected activities aimed at efficiently managing the flow of goods, services, and information across the supply chain. Key functions include:

Planning and Forecasting: Forecasting demand, setting inventory levels, and developing strategies to meet customer needs efficiently.
Sourcing and Procurement: Identifying suppliers, negotiating contracts, and acquiring raw materials or components necessary for production.
Production and Manufacturing: Managing production processes to ensure timely and quality manufacturing of products.
Inventory Management: Optimizing inventory levels to balance supply and demand while minimizing carrying costs and stockouts.
Logistics and Transportation: Coordinating the movement of goods from suppliers to customers, including transportation, warehousing, and distribution.
Distribution and Fulfillment: Managing distribution networks and fulfillment operations to ensure timely delivery and customer satisfaction.

Supplier Relationship Management (SRM): Cultivating strong relationships with suppliers to ensure reliability, quality, and cost-effectiveness.

Demand Planning and Customer Service: Anticipating customer demand and providing excellent service to meet customer expectations.

Quality Control and Assurance: Implementing quality management practices to ensure products meet or exceed customer requirements and regulatory standards.

Risk Management: Identifying and mitigating risks that may disrupt the supply chain, such as supply shortages, natural disasters, or geopolitical issues.

Information Systems and Technology: Utilizing technology and information systems, such as SCM software and data analytics, to improve visibility, collaboration, and decision-making across the supply chain.

Supplier Relationship Management (SRM)

Supplier Relationship Management (SRM) is the strategic management of interactions between a company and its suppliers to maximize mutual value and achieve business objectives. It involves selecting the right suppliers, negotiating favorable contracts, monitoring performance, and fostering collaboration and innovation. SRM aims to build strong, long-term relationships based on trust, transparency, and shared goals. By effectively managing supplier relationships, organizations can reduce costs, improve quality, mitigate risks, enhance efficiency, and drive innovation throughout the supply chain, ultimately gaining a competitive advantage and ensuring supply chain resilience in a dynamic business environment.

Functions of SRM

The functions of Supplier Relationship Management (SRM) encompass various activities aimed at fostering strong, mutually beneficial relationships with suppliers to optimize supply chain performance and drive business success. Key functions include:

Supplier Segmentation: Classifying suppliers based on criteria such as strategic importance, risk profile, and value contribution to tailor relationship management strategies accordingly.

Supplier Selection and Onboarding: Identifying and evaluating potential suppliers, conducting due diligence, and facilitating the onboarding process to establish productive partnerships.

Contract Management: Negotiating and managing contracts and agreements with suppliers, ensuring alignment with business objectives, terms compliance, and value realization.

Supplier Performance Measurement: Defining and tracking key performance indicators (KPIs) to assess supplier performance in areas such as quality, delivery. cost, and responsiveness.

Continuous Improvement Initiatives: Collaborating with suppliers to identify opportunities for process optimization, cost reduction, quality enhancement, and innovation through joint improvement programs.

Risk Management: Identifying, assessing, and mitigating risks associated with suppliers, such as supply chain disruptions, quality issues, geopolitical instability, or financial risks.

Relationship Building and Collaboration: Cultivating strong relationships through open communication, trust-building, and collaboration on strategic initiatives, such as product development, sustainability efforts, or market expansion.

Supplier Development and Capability Building: Investing in supplier capabilities and capacity building initiatives to enhance their performance, competitiveness, and alignment with organizational goals. **Conflict Resolution:** Addressing conflicts or disputes promptly and effectively through transparent communication, negotiation, and problem-solving to preserve the integrity of the supplier relationship.

Supplier Exit Management: Strategically managing the end of supplier relationships, including transition planning, knowledge transfer, and adherence to contractual obligations

Marketplace

The digital marketplace refers to an online platform where buyers and sellers come together to conduct transactions for goods, services, or information. These marketplaces operate in a virtual environment, allowing for transactions to occur electronically over the internet.

Marketplace can be differentiated on following aspects:

Product Focus: Some marketplaces specialize in specific products or services, catering to niche markets with specialized offerings.
Geographic Reach: Marketplaces may focus on local, regional, or global markets, influencing their reach and customer base. **User Experience:** Differentiated marketplaces prioritize user experience, offering unique interfaces, features, and services.
Transactional Model: Variations in transactional models, such as retail, wholesale, or auction, differentiate marketplaces in terms of pricing and engagement.
Value-added Services: Marketplaces differentiate through value-added services like fulfillment, payment processing, or customer support, enhancing the overall customer experience.

Functions of Marketplace

The main functions of a digital marketplace include:
Connecting Buyers and Sellers: Facilitating the interaction between buyers and sellers, allowing them to find each other and engage in transactions.
Listing and Discovery: Allowing sellers to list their products or services and enabling buyers to discover and browse available offerings.
Transaction Management: Managing the transaction process, including order placement, payment processing, and order fulfillment.
Feedback and Review: Providing mechanisms for buyers to leave feedback and reviews about their experiences with sellers, helping to build trust and reputation.
Customer Support: Offering customer support services to address inquiries, issues, and concerns from buyers and sellers.
Security and Trust: Implementing security measures to protect the integrity of transactions and foster trust between buyers and sellers.
Payment Processing: Facilitating secure payment processing, often through integrated payment gateways, to complete transactions.
Data Analytics: Collecting and analyzing data on user behavior, transactions, and trends to optimize the marketplace's performance and enhance user experience.
Seller Tools and Support: Providing sellers with tools and support to manage their listings, monitor sales performance, and optimize their presence on the marketplace.
Localization and Personalization: Offering localization and personalization features to tailor the marketplace experience based on the user's location, preferences, and behavior.

These functions collectively enable digital marketplaces to facilitate efficient and convenient transactions between buyers and sellers in an online environment.

INFORMATION SECURITY MANAGEMENT

Information Security Management (ISM) is the systematic approach to protecting sensitive information from unauthorized access, use, disclosure, disruption, modification, or destruction. It encompasses policies, procedures, technologies, and controls designed to safeguard data and maintain confidentiality, integrity, and availability. ISM involves risk assessment, implementation of security measures, continuous monitoring, and incident response to mitigate security threats. Key components include access control, encryption, network security, employee training, and compliance with regulatory requirements. By effectively managing information security, organizations can safeguard their assets. maintain trust with stakeholders, and mitigate the risks associated with cyber threats and data breaches .

Objectives of ISM

The overall objective of ISM is to protect the information assets of the organization due to the above mentioned protection goals. This leads to specific ISM objectives :

- Safeguard sensitive data from unauthorized access, use, or disclosure.
- Ensure data confidentiality, integrity, and availability.
- Identify and mitigate security risks effectively.
- Establish and enforce robust security policies, procedures, and controls.
- Implement access controls and encryption measures.
- Train employees to recognize and respond to security threats.
- Monitor systems for anomalies and security breaches.
- Maintain compliance with relevant laws, regulations, and standards.
- Minimize the impact of security incidents through prompt response.
- Build trust and protect the organization's reputation.

ISM Process

Organizations can establish a comprehensive ISM process to safeguard their information assets effectively by following phases given below. The Information Security Management

Continuous Improvement: BCM is an ongoing process that requires regular review and updates to adapt to changing threats, organizational changes, and lessons learned from past incidents.

(ISM) process broken down into the phases of initialize, analyze and develop, plan and implement, and operation and monitoring:

1. Initialize:

- Establish governance structures and allocate responsibilities.
- Define the scope and objectives of the ISM process.
- Identify relevant laws, regulations, and standards.
- Initiate risk assessment activities.

2. Analyze and Develop:

- Conduct risk assessments to identify threats, vulnerabilities, and impacts.
- Analyze assessment results to prioritize risks and develop mitigation strategies.
- Develop information security policies, procedures, and controls.
- Design security architecture and select appropriate technologies.

3. Plan and Implement:

- Develop an implementation plan based on identified security requirements.
- Deploy security measures and controls according to the implementation plan.
- Provide training and awareness programs for employees on security policies and procedures.
- Test and validate security controls to ensure effectiveness.

4. Operation and Monitoring:

- Operate security controls to protect information assets and mitigate risks.
- Monitor systems and networks for security incidents and anomalies.
- Respond promptly to security incidents and breaches according to established procedures.
- Conduct regular reviews and audits to assess the effectiveness of security measures.
- Update security policies, procedures, and controls based on emerging threats and vulnerabilities**.**

ISM Actions

Here are some key actions associated with Information Security Management (ISM):

1. Risk Assessment:

- Identify and assess potential security risks to information assets.
- Evaluate threats, vulnerabilities, and potential impacts.

- Prioritize risks based on severity and likelihood.

2. Policy Development:

- Establish comprehensive information security policies and procedures.
- Define standards and guidelines for protecting information assets
- Communicate policies to employees and stakeholders.

3. Access Control:

- Implement access controls to ensure that only authorized users can access sensitive information.
- Use authentication mechanisms such as passwords, biometrics, or multi-factor authentication.
- Enforce least privilege principles to limit access rights based on job roles and responsibilities.

4. Encryption:

- Encrypt sensitive data at rest and in transit to protect it from unauthorized access.
- Use strong encryption algorithms and key management practices.
- Implement encryption for email, file storage, and communication channels.

5. Security Awareness Training:

- Provide education and training to employees on information security best practices.
- Raise awareness of security risks, threats, and social engineering techniques.
- Promote a culture of security throughout the organization.

6. Incident Response:

- Develop and maintain an incident response plan to address security incidents and breaches.
- Establish procedures for detecting, reporting, and responding to security incidents.
- Conduct regular drills and simulations to test the effectiveness of the incident response plan.

7. Security Monitoring: •

- Monitor systems and networks for security events, anomalies, and suspicious activities.
- Use security information and event management (SIEM) tools to centralize and analyze security logs.
- Implement intrusion detection and prevention systems (IDS/IPS) to detect and block malicious activities.

8.Compliance Management:

- Ensure compliance with relevant laws, regulations, and industry standards (eg, GDPR, HIPAA, PCI DSS).
- Conduct regular audits and assessments to verify compliance with security requirements.
- Address any non-compliance issues and implement corrective actions.

ISM Documents

Information Security Management (ISM) typically involves the creation and maintenance of various documents to support its processes and procedures. Here are some common documents associated with ISM:

- **Information Security Policy:** Defines the organization's commitment to security, objectives, and principles, providing a framework for security efforts.
- **Risk Assessment Report:** Identifies and evaluates security risks, their potential impacts, and recommendations for mitigation, guiding resource allocation and risk management efforts.
- **Incident Response Plan:** Outlines procedures to follow in the event of security incidents, specifying roles, communication protocols, and response actions to minimize impact.
- **Security Policies and Standards:** Establishes requirements and guidelines for various security domains, including data classification, access control, encryption, and network security.

- Security Awareness Training Materials: Educates employees on security best practices, policies, and procedures to raise awareness and foster a security-conscious culture.
- **Security Audit Reports:** Documents findings from security audits, assessments, and compliance reviews, providing insights into security posture and areas for improvement.
- **Business Continuity and Disaster Recovery Plans:** Outlines strategies and procedures for maintaining business operations and recovering from security incidents or disasters.
- **Compliance Documentation:** Demonstrates adherence to regulatory requirements, industry standards, and internal policies through audit reports, certifications, and evidence of controls implementation.

ISM TECHNOLOGY

Key technologies for ISM are:

1. Data Encryption

Data encryption is the process of converting plaintext into ciphertext using cryptographic algorithms. It ensures that sensitive information remains unreadable to unauthorized users, enhancing data security. Encryption typically requires a key to encrypt and decrypt data, providing confidentiality and protection against unauthorized access and data breaches.

1. Steganography

It is the practice of concealing messages or information within other non-secret data (like images, audio files, or text) to avoid detection. It aims to hide the existence of the communicated information.

It's a way to send secret information without anyone knowing it's there. By changing tiny parts of the picture or song, the hidden message stays invisible to most people. It helps keep information private during communication, like a secret code within something that looks ordinary.

Example

Imagine you have a picture of a beach with a colorful umbrella. In steganography, you can hide a secret message within this image without changing its appearance much.

Let's say you and your friend agree to use a simple method: hiding the message in the colors of the umbrella. Each color in the image is made up of three primary colors: red, green, and blue.

Your secret message is "HI". To hide this message:

1. *Convert Message to Binary*

- H: 01001000
- I: 01001001

2. Modify Pixel Colors: You change the last bit of each color component (red, green, and blue) in some pixels of the umbrella to represent your binary message. For example

- Change the last bit of some red, green, and blue values to match the binary of "HI" in selected pixels of the umbrella without significantly changing the overall colors.

3. Send the Image: You send the modified beach image to your friend.

4. Retrieve the Message: Your friend knows which pixels and colors to look at to extract the hidden message. They identify these modified bits.

5. Convert Binary Back to Text: By converting the retrieved binary back to text:

- 01001000: H
- 01001001

Your friend reveals the hidden message as **"HI"!**

In this example, the message "HI" was hidden within the colors of the umbrella without noticeably altering the overall appearance of the beach image. This demonstrates a basic way steganography can hide messages within images.

2. Symmetric-Cryptography

A private key cryptography (Symmetric-key system) is a method in which the same key is used to encrypt and decrypt the message. In private-key cryptography, sender and the recipient of the message must agree on a common key via some alternative secure channel.

Symmetric-key systems are simpler and faster, but their main drawback is that the two parties must somehow exchange the key in a secure way. Public-key encryption avoids this problem because the public key can be distributed in a non-secure way, and the private key is never transmitted.

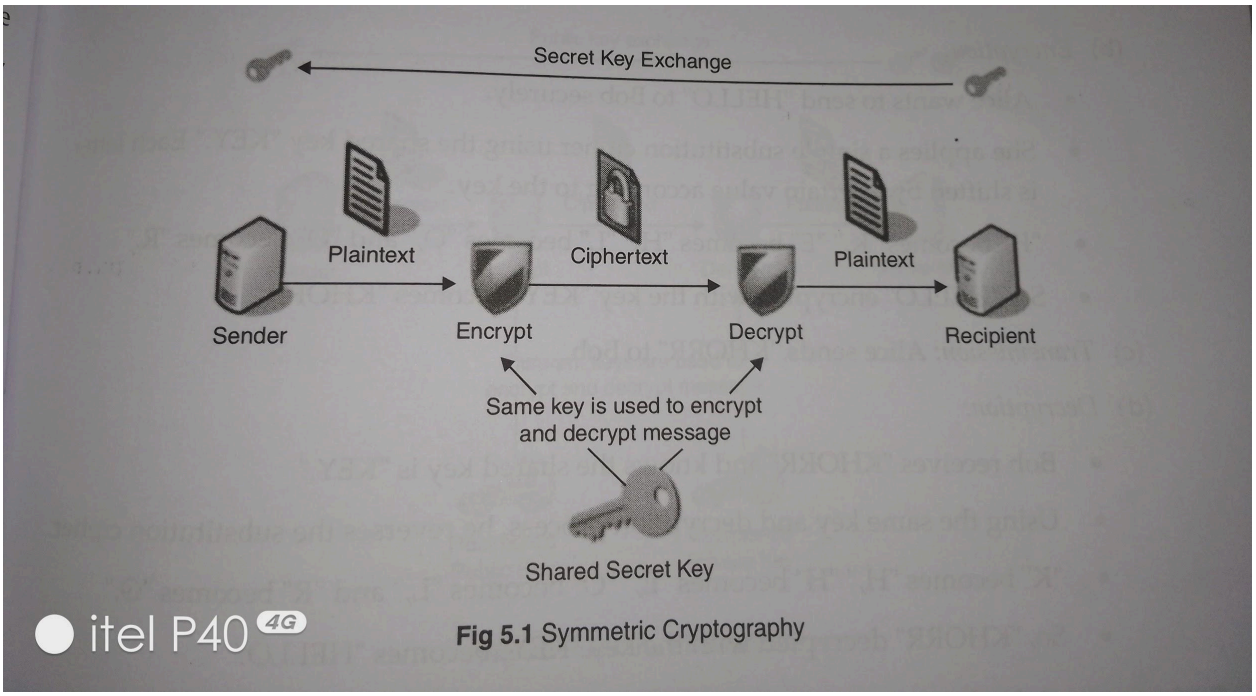


Fig 5.1 Symmetric Cryptography

Private-key encryption involves the following steps:

1. The sender creates a ciphertext message by encrypting the plaintext message with a symmetric encryption algorithm and a shared key.
2. The sender sends the ciphertext message to the recipient.
3. The recipient decrypts the ciphertext message back into plaintext with a shared key.

Implementations of symmetric-key encryption can be highly efficient, so that users do not experience any significant time delay as a result of the encryption and decryption. Symmetric-key encryption also provides a degree of authentication, since information encrypted with one symmetric key cannot be decrypted with any other symmetric key. Thus, as long as the symmetric key is kept secret by the two parties using it to encrypt communications, each party can be sure that it is communicating with the other as long as the decrypted messages continue to make sense.

Example:

Let's consider the encryption of the word "HELLO" using a symmetric key and a simple substitution cipher:

(a**) Key Generation:** Alice and Bob agree on a secret key, let's say "KEY" for this example.

(b) Encryption:

- Alice wants to send "HELLO" to Bob securely.
- She applies a simple substitution cipher using the shared key "KEY." Each letter is shifted by a certain value according to the key.
- "H" becomes "K," "E" becomes "H," "L" becomes "O," and "O" becomes "R".
- So, "HELLO" encrypted with the key "KEY" becomes "KHORR.

(c) Transmission: Alice sends "KHORR" to Bob.

(d) Decryption:

- Bob receives "KHORR" and knows the shared key is "KEY."
- Using the same key and decryption process, he reverses the substitution cipher.
- "K" becomes "H," "H" becomes "E," "O" becomes "L," and "R" becomes "O."
- So, "KHORR" decrypted with the key "KEY" becomes "HELLO"

3. Asymmetric-Cryptography

Public-key cryptography, also known as asymmetric cryptography, is a class of cryptographic *system that uses two keys - a public key* and *a private key.* A public key is known to everyone *while private (or secret key)* is known only to the recipient of the message.

The term "asymmetric stems from the use of these two keys to perform these opposite functions. The public and private keys are related in such a way that only the public key can be used to encrypt messages and only the corresponding private key can be used to decrypt them. The public key encrypt plaintext or to verify a digital signature whereas the private key decrypt ciphertext or to create a digital signature.

As illustrated in asymmetric encryption involves the following steps:

- The sender creates a ciphertext message by encrypting the plaintext message with an asymmetric encryption algorithm and the recipient's public key.
- The sender sends the ciphertext message to recipient
- The recipient decrypts the ciphertext message back to plaintext using the private key that corresponds to the public key that was used to encrypt the message.

With public key encryption, the sender converts the plaintext message into ciphertext by encrypting it with the public key in the message recipient's X.509 certificate. The message recipient converts the ciphertext back into the plaintext message by decrypting it with the corresponding private key.

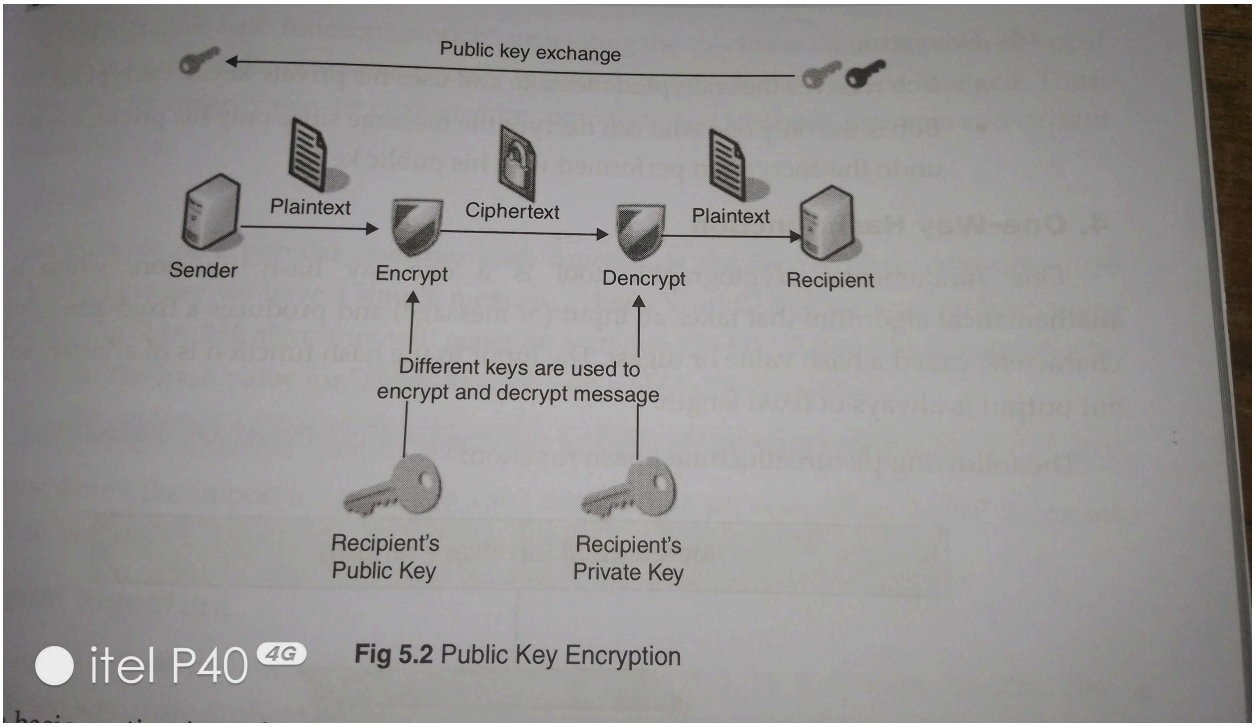


Fig 5.2 Public Key Encryption

The basic motivation of using Public Key Cryptography is to send messages in such a way that only the person who receives them can understand them. By using public key encryption, a message sender has assurance that only the recipient will be able to read the message.

Example:

Here's an example to illustrate public key cryptography:

Imagine Alice wants to send a secure message to Bob using public key cryptography:

(a) Key Generation:

- Bob generates a pair of keys: a public key and a private key.
- The public key is shared openly, while the private key is kept secret.

(b) Encryption:

- Alice encrypts her message using Bob's publicly available encryption (public) key.
- Only Bob's private key, which only Bob possesses, can decrypt the message encrypted with his public key.

(c) Transmission:

- Alice sends the encrypted message to Bob.

(d) Decryption:

- Bob receives the encrypted message and uses his private key to decrypt it.
- Bob is the only one who can decrypt the message since only his private key can undo the encryption performed with his public key.

4. One-Way Hash function

B bOne fundamental cryptographic tool is a one-way hash function, which is a mathematical algorithm that takes an input (or message) and produces a fixed-size string of characters, called a hash value or digest. The input to the hash function is of arbitrary length but output is always of fixed length.

The following picture illustrated hash function:

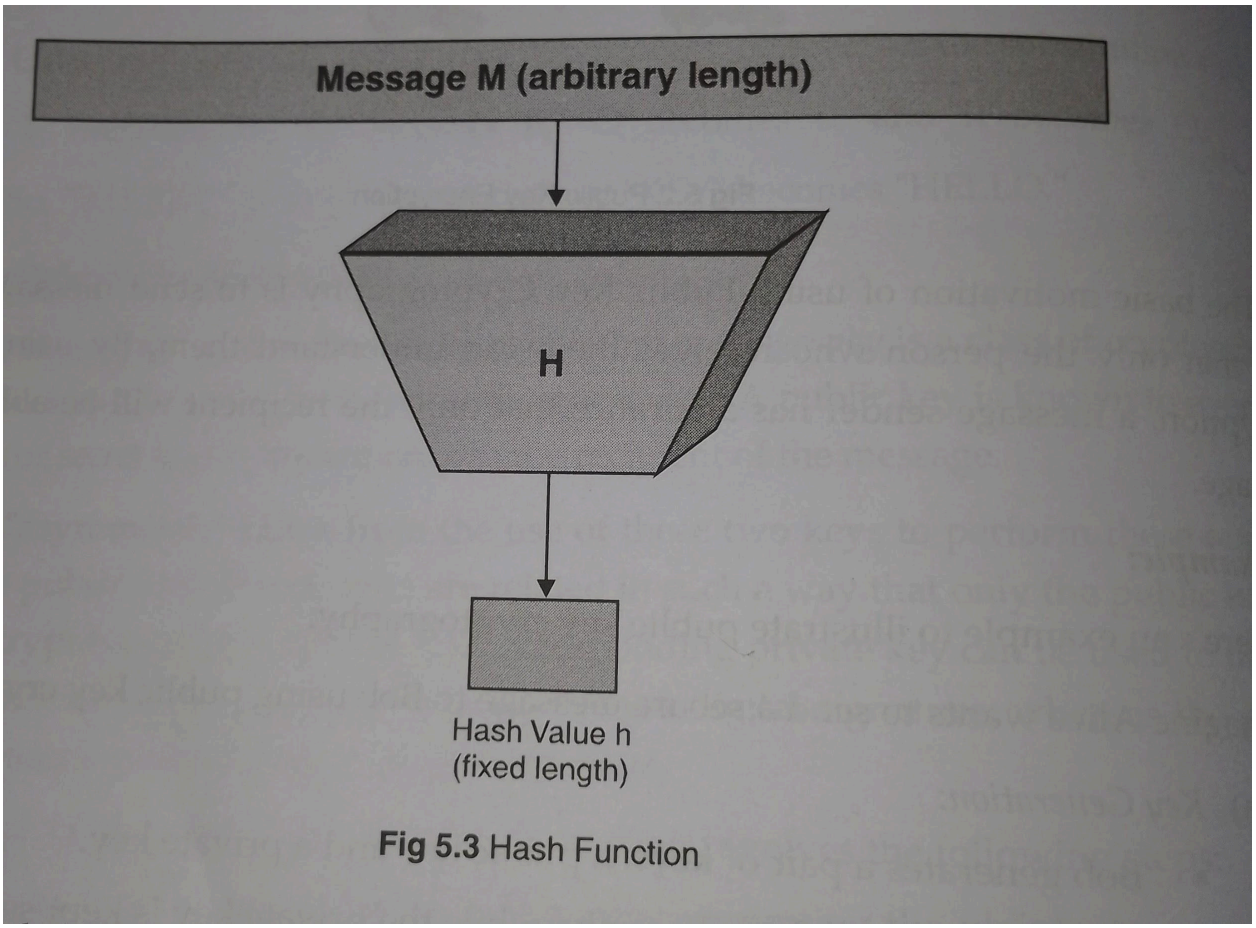


Fig 5.3 Hash Function

One-way hash functions have three main properties:

- **Deterministic:** For a given input, the hash function always produces the same output.
- **Fixed Output Size:** Regardless of the input size, the hash function generates a fixed- size output.

- **Non-Reversible:** It is computationally infeasible to reverse the hash function to obtain the original input from the hash value.

Cryptographic hash functions work by generating the checksum value of a data object. If the data is intentionally or unintentionally modified, the checksum value is changed. Thus, a data object's integrity may be evaluated by comparing and verifying previous and current checksums.

Example:

An example of a popular one-way hash function is the Secure Hash Algorithm 256 (SHA-256). Let's say we have a simple message, "Hello, World!" that we want to hash using SHA-256. The SHA-256 algorithm will generate a unique 256-bit (32-byte) hash value for the given input. The hash value for "Hello, World!" using SHA-256 would be:

2cf24dba5fb0a30e26e83b2ac5b9e29e1b161e5c1fa7425e7304336293869824."

B Now, here's the important part: you can't reverse this process. Once "hello" turns into that code, you can't get "hello" back from the code. It's a one-way street!

5. Digital Signature

A digital signature authenticates electronic documents in a similar manner like a handwritten signature authenticates printed documents. This signature cannot be faked and it claims that a named person wrote or otherwise agreed to the document to which the signature is attached. The recipient of a digitally signed message can verify that the message originated from the person whose signature is attached to the document and that the message has not been altered either intentionally or accidentally since it was signed. Also the signer of a document cannot later disagree with it by claiming that the signature was forged. In other words digital signatures enable the authentication of digital messages assuring the recipient of a digital message of both the identity of the sender and the integrity of the message.

In short, it is used:

- To ensure message content integrity
- To verify the authenticity of the message sender

Example:

Imagine you're sending a secret letter to your friend, but you want to make sure it doesn't get tampered with and your friend knows it's really from you.

1. Creating the Digital Signature: First, you write your letter. Then, you create a unique code that represents your letter. This code is like a secret mark only you can create.

2. Using Your Secret Code: You use your secret code to "lock" your letter. This is your digital signature. Your letter is now locked, and no one can change it without breaking the lock.

3. Sending the Letter: You send the locked letter to your friend.

4**. Verification by Your Friend:** Your friend receives the locked letter and sees your digital signature. They use a special key (your public key) to unlock the signature. If it unlocks successfully, they get the code that represents your original letter.

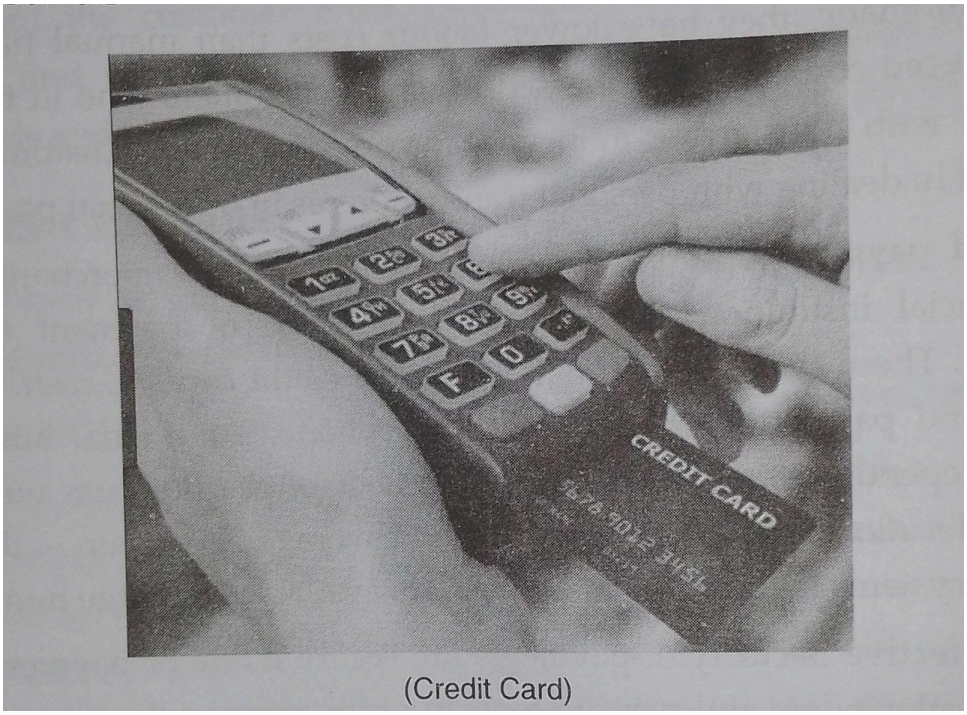
5. Checking Integrity: Your friend checks the code they got by unlocking the signature. If it matches the code they create from the letter, they know the letter hasn't been changed and is genuinely from you.

In this way, a digital signature works like a lock and key. You create a unique lock (the signature) only you can make, and your friend uses a key (your public key) to unlock it and check if the letter is still the same as when you sent it. This ensures that your message remains secure, unaltered, and authentic during transmission.

METHODS OF E-PAYMENT

The different types of electronic payment schemes most common today are discussed below:

1 Credit Cards



(Credit Card)

Credit card is a small plastic card having a magnetic strip issued by a bank or a non- banking financial company (NBFC) which allows holder to purchase goods or services on credit. Payment using credit card is one of the most popular forms of e-payment for consumer goods and services all over the world because you can use them almost anywhere for almost any kind of purchase, and you do not have to have cash on hand to pay for things.

A credit card holder can purchase products or services without cash and to pay for them at a later date. The consumer must open an account with a bank or company to get credit card. The card issuer gives a credit limit with a specified amount. The card holder can use the card to make purchases until they reach this credit limit. Every month the sponsor provides a bill, which tallies the card activity during the previous 30 days. Depending on the terms of the card, the customer may pay interest charges on the amount that they do not pay for on a monthly basis. Credit card interest rates, annual fees, and repayment terms may vary considerably. The Credit-card issuers get revenue from annual fees and interest paid by cardholder. Also, credit cards may be sponsored by large retailers (such as major clothing or department stores) or by banks or corporations (like VISA or American Express).

Benefits of Credit Card Payment Process

Following are the benefit of credit card payment system.

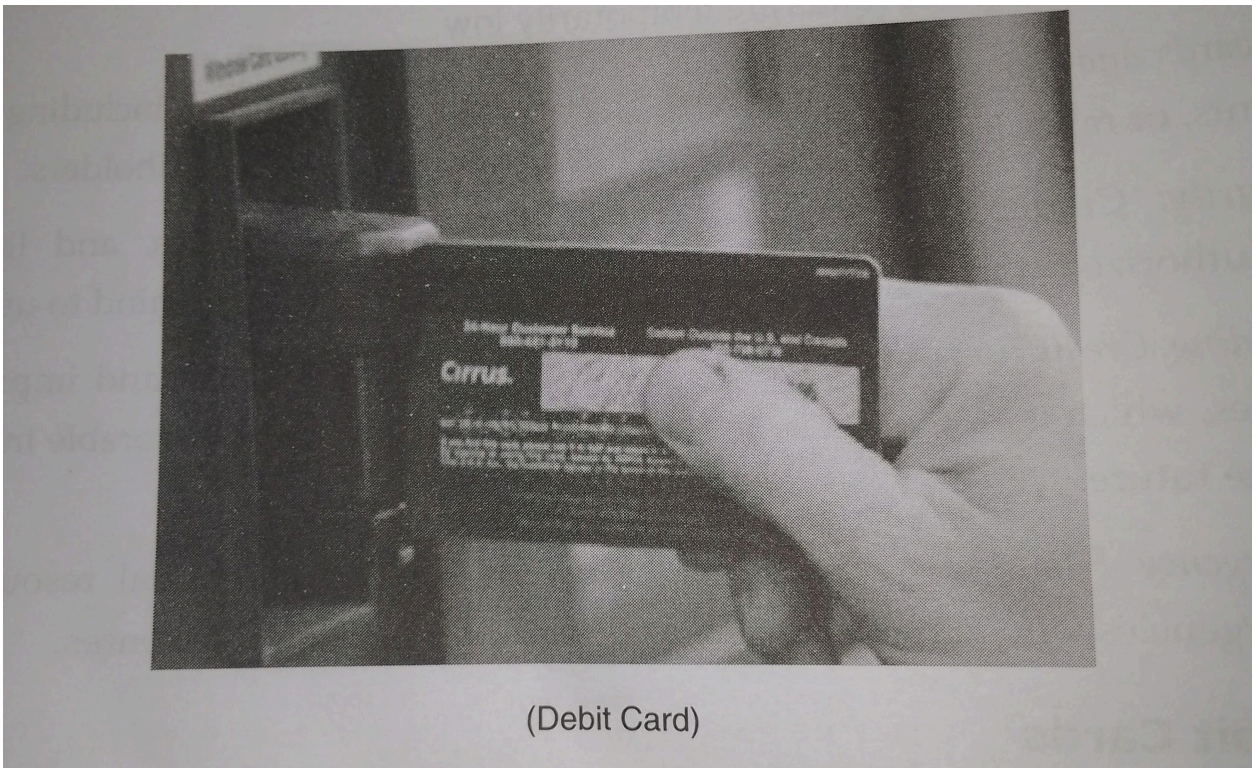
- Convenience: Credit cards offer a convenient payment method for purchases online and in-store, eliminating the need for carrying cash.
- Financial Flexibility: They provide access to a line of credit, allowing users to make purchases even when funds are temporarily low.
- Rewards and Perks: Many credit cards offer rewards programs, including cashback, points, or miles for spending, providing tangible benefits for cardholders.
- Security: Credit cards come with fraud protection measures, and liability for unauthorized transactions is typically limited, offering peace of mind to users.
- Building Credit: Responsible credit card use can help establish and improve credit scores, which is essential for obtaining loans, mortgages, and favorable interest rates in the future.
- Emergency Funds: Credit cards can serve as a backup financial resource during emergencies when immediate cash is needed for unexpected expenses.

2 Debit Cards

A debit card (or bank card) is a plastic electronic card issued by a bank which allows bank clients access to their account to withdraw cash or pay for goods and services.
Unlike credit cards, the debit card immediately transfers money from the client's account to the business account. This removes the need for bank clients to go to the bank to remove cash from their account as they can now just go to an ATM or pay electronically at merchant locations. In many countries, the use of debit cards has become so widespread that it entirely replaced cheques and cash transactions.

When a debit card is presented at the point of sale, the merchant swipes the card through an electronic cash register that automatically routes a request for authorization to the bank that issued the card. This electronic cash register reads the cardholders account information from the magnetic stripe on the back of the card and forwards this information, along with the purchase price, to the card-issuing bank. After checking the account number against a file of lost or stolen cards and verifying that funds (or credit) are available, the bank sends confirmation that payment is authorized. This authorization procedure certainly enhances the security of the retail payment system.

With the debit card, the customer can only pay for purchased goods with the money that is already there in his/her bank account as opposed to the credit card where the amounts that the buyer spends are billed to him/her and payments are made at the end of the billing period. So, it is important for card holder to keep sufficient amount of cash balance in its bank account. It is so, since it permits to carry on the value of the transaction (i.e. purchases) to the extent of available balance in its holder's bank account. Hence the debit card also acts as prepaid card.



(Debit Card)

Almost every bank issue debit card. The bank takes nominal charges as an annual fee for the issuance and maintenance of card.
The major benefits of debit card are convenience and security. The use of debit card removes the hassles associated with having to write checks as payment like showing ID and associated fees. Debit cards are also considered to be a safer form of payment as a code is required to access the account funds, while checks can be easily stolen.
The other benefits of using debit cards are as follows:

- Debit card is very easy to carry and handle.
- You can access your account any time, anywhere without depending on the personnel of the bank.
- No intermediaries so the operation is fast which saves precious time.
- It provides safety and comfort in finance-related activities.
- Less complicated, as consumers are required only to enter PIN.
- Banks can issue debit card to any individual without assessing their credit worthiness. • You do not need to carry a huge amount of cash. Hence, it minimizes risk of loss due to theft, damage, etc.
- You can also use a debit card as an ATM card to meet your cash-related needs, anytime and anywhere.
- If your card is stolen, your money is still safe since the thief would need your PIN number to access the card.

3 E-Cash

E-cash is a form of an electronic payment system of which a certain amount of money is stored on a client device (PC or mobile device) and made accessible for internet transactions. Electronic cash is also known as (cybercash, digital cash, e-money) and it makes use of e-cash software installed on the user PC or electronic devices. In e-cash, both customer and merchant have to sign up with bank issuing e-cash. E-cash is transferred directly from the customer's desktop to the merchant's site. Therefore, e-cash transactions usually require no remote authorization, no signature validation and no personal identification number (PIN) codes to confirm identities at the point of sale. It is just like transmitting numbers from one computer to another.

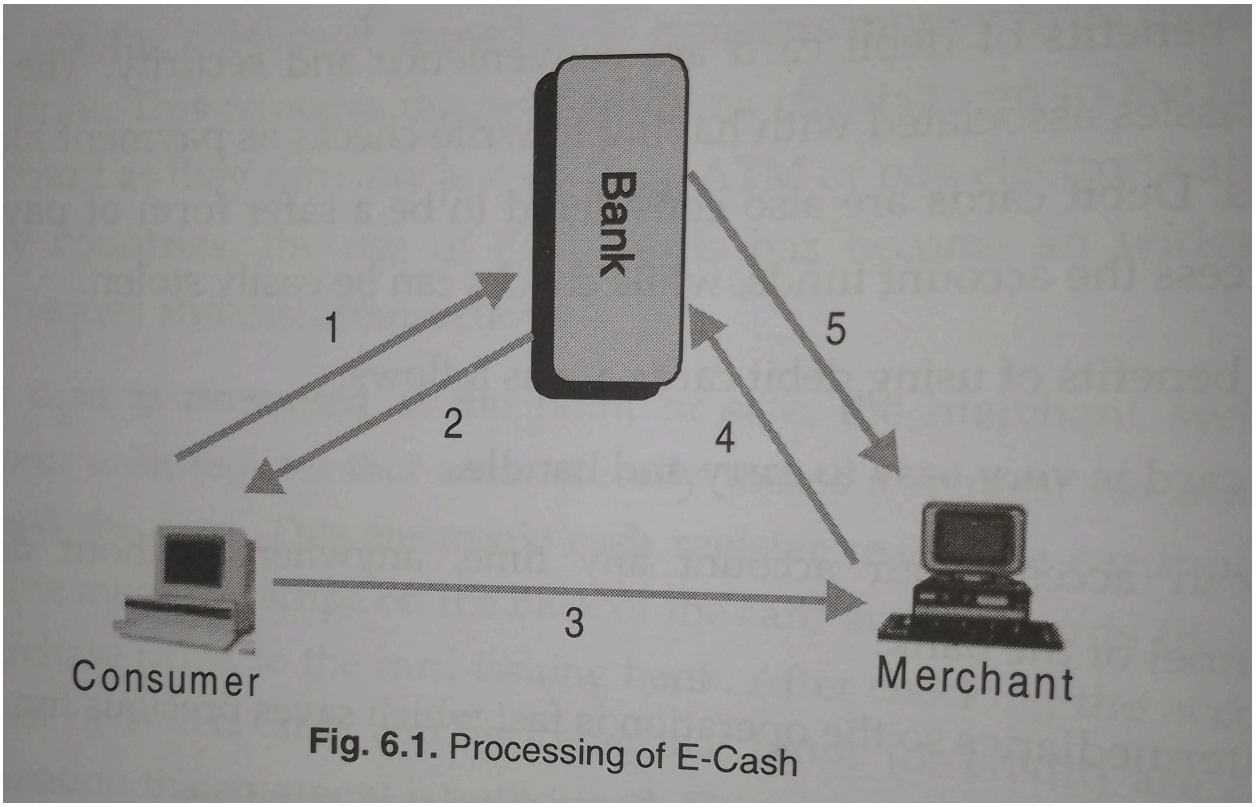


Fig. 6.1. Processing of E-Cash

E-cash can be implemented in two ways, on-line and off-line. On-line means E-cash is stored by the bank or issuer and consumer needs to request for it when a consumer makes payment. Different from online, off-line e-cash is kept by consumer in a device such as smart card or other type of token.

E-cash Concept

The user first must have an e-cash software program and an e-cash bank account from which e-cash can be withdrawn or deposited. The user withdraws the ecash from the account onto his/her computer and spends it in the Internet without being traced or having personal information available to other parties that

are involved in the process. The recipients of the e-cash send the money to their bank account as with depositing "real" cash.

1. Consumer buys e-cash from bank
2. Bank sends e-cash bits to consumer (after charging that amount plus fee)
3. Consumer sends e-cash to merchant
4. Merchant checks with bank that e-cash is valid (check for forgery or fraud)
5. Bank verifies that e-cash is valid
6. Parties complete transaction: e.g., merchant present e-cash to issuing back for deposit once goods or services are delivered

Electronic cash allows a customer to make an anonymous purchase over the Internet, just as he can with paper cash. When a customer withdraws paper money from the bank and uses it to buy a product at a store, the bank does not know where the customer has shopped, and the store does not know which bank the customer uses.

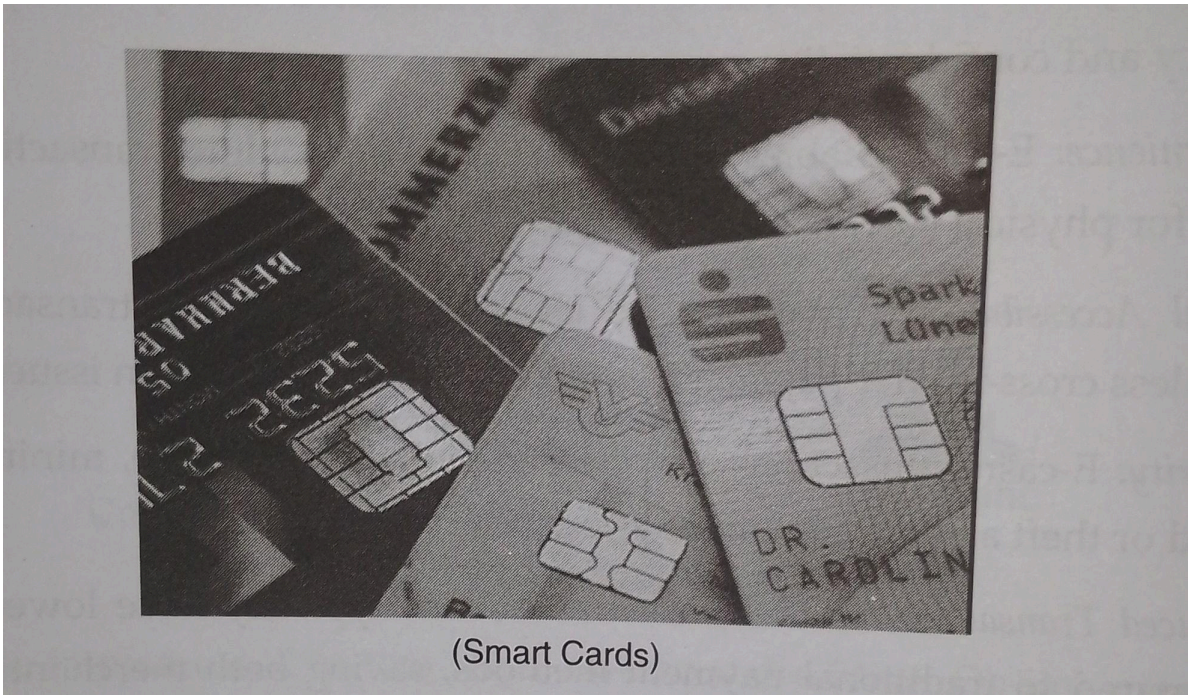
Benefits of E-Cash

- Anonymity: E-cash transactions can be conducted anonymously, preserving user privacy and confidentiality.
- Convenience: E-cash enables swift and hassle-free online transactions, reducing the need for physical currency or checks.
- Global Accessibility:E-cash can be used for international transactions, facilitating seamless cross-border payments without currency conversion issues.
- Security: E-cash transactions are often encrypted and secure, minimizing the risk of fraud or theft associated with physical cash.
- Reduced Transaction Costs: E-cash transactions typically have lower processing fees compared to traditional payment methods, saving both merchants and consumers money.
- Financial Inclusion: E-cash can reach unbanked populations, providing access to financial services and promoting economic participation.
- Flexibility: E-cash systems can accommodate various denominations and transaction sizes, catering to diverse financial needs and preferences
- Environmentally Friendly: E-cash reduces the reliance on paper currency, contributing to environmental sustainability and conservation efforts.
- Instant Settlement. E-cash transactions settle instantly, enabling immediate access to funds without delays or waiting periods.
- Innovation and Adaptability: E-cash systems continue to evolve with technological advancements, offering new features and functionalities to meet changing consumer needs

4 Smart Cards

B A Smart Card is similar to credit and debit card in appearance but it has a small built-in microprocessor chip and memory which is used for identification or financial transactions.

These cards have self-contained operating systems and so are ideal for applications where security is an issue. Their memory capacity is also considerably larger than that of the more conventional magstripe cards. Specially designed card readers-writers are required to read or alter the information on a smart card. The smart card can be defined as a "portable data storage device with intelligence and provisions for identity and security". Smart card chips are usually smaller and thinner than normal computer chips and their normal life is at least five years.



(Smart Cards)

Smart cards find applications in a wide variety of fields including banking industry, computer security systems, wireless communications, loyalty systems, satellite TV access or even government identification. They are widely used as credit and debit cards to perform financial transactions without the use of paper currency. In the case of financial transactions, the card records each transaction and does not reveal the user's password to any external system. The smart-card assures protection of data stored and offers user authentication facilities.

A plastic card containing a computer chip enables the holder to purchase goods and services, enter restricted areas, access medical, financial, or other records, or perform other operations that require data stored on the chip.

A smart card is more secure than a magnetic stripe card. If you enter an incorrect password too many times, the card will be disabled temporarily. This small plastic card embedded with the computing center offers a much higher level of security and the possibility of digital data storage. Credit and debit cards using this technology store the holder's PIN as well as recent transactions.

To use a smart card, either to pull information from it or add data to it, you need a smart card reader, a small device into which you insert the smart card. When inserted into a reader or brought in close contact with a reader, it transfers data to a central computer and receives responses.

The greatest disadvantage of using credit is that most of the information must be stored in online mainframe computer networks, from where it is verified and processed. Smart cards however, with an embedded microprocessor store information, since all the security required is embedded in the microprocessor. When a computer communicates with the card, the microprocessor enforces access to retrieve data from the card's memory banks. The more advantages of smart card are discussed below:

Benefits of Smart Cards

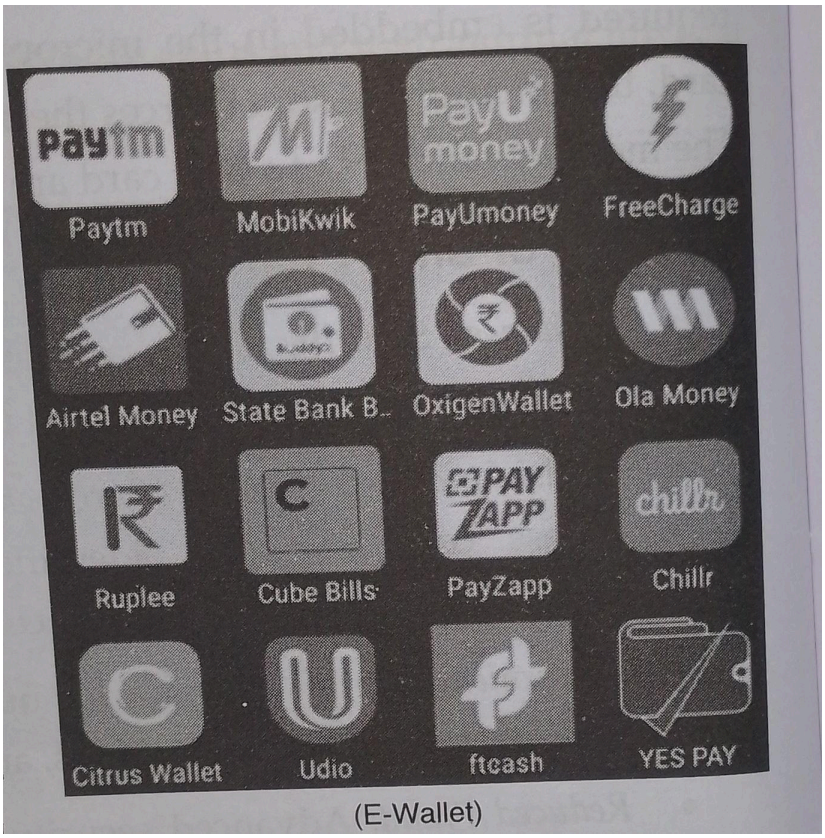
- Enhanced Security: Smart cards store data securely using encryption and require PIN verification, reducing the risk of unauthorized access or fraud.
- Multi-functionality: Smart cards can serve multiple purposes, such as payment cards, access control badges, identification cards, and transit passes, consolidating functionalities into a single device.
- Convenience: Smart cards offer quick and efficient transactions, enabling users to make purchases, access facilities, and authenticate identities with ease.

- Reduced Fraud: Advanced security features like chip technology make smart cards less susceptible to counterfeiting and skimming compared to traditional magnetic stripe cards.
- Offline Capability: Some smart cards can perform transactions offline, allowing users to make payments even in areas with limited connectivity.
- Cost Savings: Smart cards can streamline administrative processes, reduce paperwork, and lower operational costs for businesses and organizations.
- Environmental Impact: By replacing multiple cards with a single smart card, there is a reduction in the production and disposal of plastic cards, contributing to environmental sustainability.

5 E-Purse (Digital Wallet)

E-purse (also known as an e-wallet or digital wallet) refers to an electronic device that allows users to make electronic commerce transactions quickly and securely using a financial instrument (such as a credit card, debit card or digital cash). It is an online-prepaid account used to store money and transact online and offline through a computer or a smartphone whenever required. It holds owner information, owner contact information, credit card and e-cash. The consumer provides all that information at an e-commerce site's check counter.

- For setting up an E-wallet account, the user needs to install the software on his/her device, and enter the relevant information required. After shopping online, the E-wallet automatically fills in the user's information on the payment form. To activate the E-wallet, the user needs to enter his password. Once the online payment is made, the consumer is not required to fill the order form on any other website as the information gets stored in the database and is updated automatically.
- It is just like a wallet in your pocket but the difference is that it is stored in your smartphone or tablet as an app. It allows users to purchase items using a smart-phone or online with a computer.
- It is an online-prepaid account, linked with your bank account, debit card, or credit card. It carries a preloaded Audio YES PAY monetary value and can be used as a means of payment for multiple small-value purchases.



(E-Wallet)

- You can store money in your e-wallet that you may use for cashless payment against any products or services without swiping your debit/credit cards. An E-wallet is protected with a password.

- Unlike credit or debit cards, where you have to be extra careful as they can have big balances or a huge credit limit, wallets can be loaded with small, or even exact amounts.
- Instead of entering information at every site with which the consumer wants to do business, e-purse gives consumers the benefit of entering their information just once.
- E-wallet have mainly two components, software and information. The software component stores personal information and provides security and encryption of the data. The information component is a database of details provided by the user which includes their name, shipping address, payment method, amount to be paid, credit or debit card details, etc.
- It can be used in conjunction with mobile payment systems that allow customers to pay for purchases with their smartphones. When a digital wallet is used on a smartphone, it is referred to as a mobile wallet. It is a payment gateway/service in which an amount can be transferred to a payee account through a payment application installed in the mobile. The amount can be transferred to the payee account by entering the only mobile number or Aadhaar number that is linked to its bank account.
- It allows users to complete purchases quickly and securely with near-field communications technology.
- It hides the low-level details of executing the payment protocol.
- It stores the user's payment information securely and compactly which largely eliminates the need to carry a physical wallet.
- It employs digital certificates or other encryption methods to authenticate the user.
- It secures the payment process from the consumer to the merchant.
- It can store multiple monetary implementations that include cash, debit and credit cards, and stored value cards.
- It also stores identification implements which includes national or state identification cards and driver's licenses.

7 E-Cheque (Digital Cheque)

E-Cheque (Digital Cheque) is also a form of payment made via the internet. It is an electronic version or representation of a paper cheque and designed to perform the same function as a traditional paper cheque. The only difference between normal paper cheques and electronic cheques is that e-cheque is an online and virtual version. Since the cheque is in an electronic format, it can be processed in fewer steps and has more security features than a standard paper cheque. The E-cheque system supports the transferability of funds between different clients. This feature does not exist in traditional e-payment systems such as credit card and debit cards systems.

An account holder will issue an electronic document that contains the name of the financial institution, the payer's account number, the name of payee and amount of cheque. Most of the information is in uncoded form. Like paper cheques, e-cheques are signed by the payer (the person who pays the money) and endorsed by the payee (the person who receives the money). E-cheques are transferred directly from the payer to the payee, so that the timing and the purpose of the payment are clear to the payee.

Rather than handwritten or machine-stamped signatures, e-cheques are affixed with digital signatures (based on public key cryptography). It is designed with message integrity, authentication and non-repudiation features. Security features provided by electronic cheques include authentication, public key cryptography, digital signatures and encryption, among others. In addition to the cheques 'real' signature, the transfer must be digitally signed using the sender's private key to authenticate the transfer. Electronic cheques are becoming increasingly popular because they are so fast, efficient and secure.

The E-cheque:

- can be used by all account holders, large and small, even where other electronic payment solutions are too risky, or not appropriate
- is the most secure payment instrument available today

- provides rapid and secure settlement of financial obligations
- can be used with existing checking accounts
- reduces fraud losses for all parties
- automatic verification of content and validity
- traditional checking features such as stop payments and easy reconciliation

Benefits of E-cheque

Electronic cheque system has following benefits: Efficiency:

- E-cheques streamline the cheque processing system, reducing processing times and administrative overhead for banks and businesses.
- Convenience: E-cheques enable users to create, send, and receive payments electronically, eliminating the need for physical cheque handling and mailing.
- Cost Savings: E-cheques reduce costs associated with paper cheque production, postage, and manual processing, resulting in savings for both issuers and recipients.
- Security: E-cheques incorporate encryption and authentication measures, enhancing security and reducing the risk of fraud compared to traditional paper cheques.
- Accessibility: E-cheques can be processed and cleared electronically, making funds available to recipients faster than traditional cheque clearing methods.
- Traceability: E-cheques leave digital footprints, providing a clear audit trail for transactions and facilitating reconciliation and dispute resolution.
- Environmental Impact: By reducing the consumption of paper and resources associated with cheque printing and mailing, e-cheques contribute to environmental sustainability.

Write about HTML tags.

Ans. HTML tags are special keywords that specify how a web browser must format and display the content. Tags are wrapped in brackets << and. They start with an open angle bracket (<) and close with a closed angle bracket (>). The ending tag has a forward slash before the name of the element. They can nest (be placed) inside one another. HTML tags are the fundamental elements of HTML used for defining the structure of the document. These are letters or words enclosed by angle brackets (< and >).

Usually, most HTML tags come in pairs, consisting of an opening tag and a closing tag. The opening tag marks the beginning of an element, while the closing tag, which includes a forward slash before the tag name, indicates the end of that elernent. Each tag has a different meaning and the browser reads the tags and displays the contents enclosed by it accordingly.

Syntax:

```
<tag> content </tag>
```

Basic HTML Tags:

1. Heading Tag: Heading tags are used to define headings of douments. You can use different sizes for your headings. HTML, also has six levels of headings, which use the elements <h1>,
<h2>, <h3>, <h4>, <h5>, and <h6>. While displaying any heading, browser adds one line before and one line after that heading.

Syntax:

```
<h1>Heading 1</hi>
<h2>Heading 2</h2>
<h3>Heading 3</h3>
<h4>Heading 4</h4>
<h5>Heading 5</h5>
```

<h6>Heading 6<16>

2. Paragraph Tag: This tag defines a paragraph. When we use the tag, the web browser automatically inserts a single blank line before and after each element to make the text more readable.

Example:

My first paragraph.

3. Image Tag (<img>): The image tag allows us to insert images into a web page. It has no closing tag. The attributes of the image tag include:

- src: the source file (src)
- alt alternative text
- width
- height

Example:

<img src="naukrileaming jpg" alt="naukri leaming" width="100" height="100">

4.

5.

6. The <a> tag or the anchor tag allows us to link one web page to another page or a section of the same page. The <a> tag has an href attribute that holds the destination URL. Using the anchor tag, we can create a hyperlink to web pages, files, email addresses, segments on the same page, etc.

Example:

This is a link

7. Comment Tag: The comment tag helps programmers to understand the HTML source code. The comrnents are not visible on the web page in a browser.

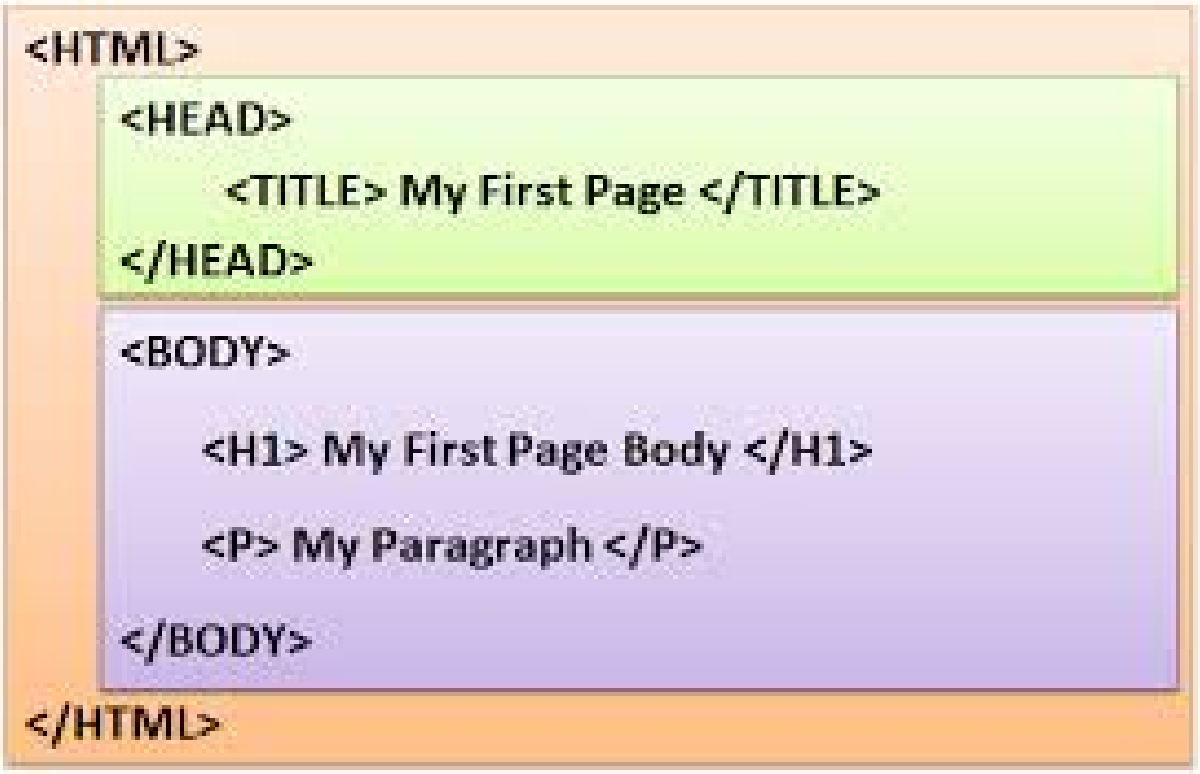
Syntax:

This is a link

Write a brief note on HTML Document Structure (or) Explain the Structural Elements of HTML.

Ans. The design structure of an HTML page follows a hierarchical structure defined by HTML (Hypertext Markup Language) itself. HTML provides a way to structure content on the web and is the standard markup language used to create web pages.

The basic design structure of an HTML page consists of a combination of elements, tags, and attributes.



1. DocumentTypeDeclaration(<!DOCTYPE>): This declaration is placed at the beginning of an HTML document to specify the version of HTML being used. It helps browsers understand the markup language and render the page correctly.
2. HTML Element (<html>): The <html> element serves as the root element of an HTML page. It encompasses the entire content of the page and contains two main sections: the head and the body.
3. Head Section (<head>): The <head> section contains meta- Information about the document, such as the page title, character encoding, linked stylesheets, scripts, and other metadata. It doesnt directly display any content on the web page.
4. Page Title (<title>): The <title> element is nested within the <head> section and specifies the title of the web page. It appears as the title of the browser's window or tab and is also used by search engines.
5. Body Section (<body>]: The <body> section is where the main content of the web page resides. It contains all the visible elements, such as headings, paragraphs, images,

links, lists, tables, forms, and more. This is where users Interact with the page.

6. Structural Elements: HTML provides a set of structural elements that define the layout and organization of content within the <body> section. Some commonly used structural elements include:

i) Headings (<h1>, <h2>,..., <h6>): These elements represent different levels of headings, where <h1> is the highest level and <h6> is the lowest.

ii) Paragraphs ( ): The element is used to define paragraphs of text.

iii) Lists (<ul>, <ol>, <li>): Unordered lists (<ul>) and ordered lists (<ol>) are used to create bullet-point or numbered lists, respectively. List items are marked with the <li> element.

iv) Divisions ( ): The element is a generic container that helps in grouping and organizing content. It can be styled and manipulated using CSS and is often used for layout purposes.

7. Semantic Elements: HTML5 introduced a set of semantic elements that provide meaning to the structure of the content. These elements convey the purpose and role of different sections of the page. Some semantic elements include <header>, <nav>, <section>, <article>, <aside>,
<footer>, and more.

For example, the header element (<header>) is used to define the introductory or navigational section of a page, while the footer element (<footer>) represents the footer section containing information like copyright, contact details, etc.

Write about HTML attributes.

Ans. Attributes define additional characteristics or properties of the element such as width and height of an image. Attributes are always specified in the start tag (or opening tag) and usually consist of name/value pairs like name="value". Attribute values should always be enclosed in quotation marks, There are some rules and characteristics of attributes like how we should use an attribute on an HTML element or tag.

- HTML provides additional information about the elements
- Attributes should always mention in the starting tag.
- All HTML elements can have attributes except a few like <head> <title>, etc.
- W3C recommend to use attributes in lowercase and keep the value in quote.

Syntax:

Celenient atribute name="value">content</element>

i) HTML Global Attributes: Global attributes are common to all HTML elements and can be used universally. Some of the most important global attributes include:

1. **id Attribute**: The id attribute is used to give a unique name or identifier to an element within a document. This makes it easier to select the element using CSS or JavaScript.

Example: <input type="text" id="TirstName"> Some content wpid-infoText">This is a paragraph.

2. Title Attribute: The title attribute gives a suggested title for the element. The syntax for the title attribute is similar as explained for id attribute. The behavior of this attribute will depend upon the element that carries it, although it is often displayed as a tooltip when cursor comes over the element or while the element is loading.

Example: <abbr title="World Wide Web Consortium">-W3C</abbr>

<img src="images/kites-thumb.jpg" alt="kites'>

3. Class Attribute: Like id attribute, the class attribute is also used to identify elements. But unlike id, the class attribute does not have to be unique in the document. This means you can apply the same class to multiple elements in a document, as shown in the following

example:

```
<input type="text" class="highlight">
 <div class="box highlight">Some content </div>
 <p class="highlight > This is a paragraph. </p>
```

4. Style Attribute: The style attribute allows for inline styling of HTML elements. It is used in conjunction with CSS properties to directly style individual elements within the HTML code.

Example: <p style="color: blue: This is paragraph</p>
<div style="border: 1px solid md.Some content

ii) **Internationalization Attributes**: These attributes help adapt the document to different languages and regions. Examples include lang and dir.

1. HTML dir Attribute: The dir attribute allows you to indicate to the browser about the direction in which the text should flow. The dir attribute can take one of two values,

Values	Description
itr	Left to right(default value)
rtl	Right to left

Example:

```
<!DOCTYPE html>
<html dir="rtl">
 <head>
<title>HTML dir Attribute</title>
<head>
 <body>
 This is how IE 5 renders right-to-left directed text
 </body>
 </html>
```

2. HTML lang Attribute: The lang attribute allows you to indicate the main language used in a document, but this attribute was kept in HTML only for backwards compatibility with earlier versions of HTML. This attribute has been replaced by the xml:lang attribute in new XHTML documents. The values of the lang attribute are ISO-639 standard two-character language codes. Check HTML Language Codes: ISO 639 for a complete list of language codes.

```
<!DOCTYPE html>
 <html lang="en">
<head>
 <title>HTML lang Attribute</title>
 </head>
<body>
        This page is the English Language
</body>
<html>
```

3. Generic Attributes: Here's a table of some other attributes that are readily usable with many of the HTML tags.

Attributes	Options	Function
Align	Right,left,center	Horizontally align tags
Bgcolor	Numeric,hexadecimal, RGB values	Places a background color behind an element

Id	User Defined	Names an element for use with CSS
Class	User Defined	Names an element for use with CSS
Width	Numeric value	Specifies the width of tables, images, or table cells
Height	Numeric value	Specifies the width of tables, images, or table cells
Title	User defined	A text to display in a tool tip

How HTML Elements Should Describe Web Page Content Accurately?

Ans. HTML documents are made up of elements that define content in that webpage. It is made of tags that surround different types of content.

In simple terms, anything from the start tag to the end tag is an HTML element. Web browsers do not display HTML tags but use them to understand the page's content.

Structure of an HTML element:

An HTML element usually consists of three parts:

- Opening tag tag name>: Name of the tag wrapped in angle brackets.
- Closing tag </tag name>: Name of the tag with a forward slash before it
- Content: The content that the tags will display, such as plain text, links, and images.

Syntax: <tagname attribute"rule">Content</tagname>

Example: <h1>My First Heading</h1>

HTML Elements Types: There are two types: block-level and inline elements.

1. Block-level Elements: The block-level elements comprise the document's structure by dividing a page into blocks. They take up the entire 100% of the available width. These elements are rendered with a line break before and after. They always start with a new line. Some common examples of block-level elements include <p>, <h1> through <h6>, , <ol>, <ul>, <li>, and
<form>.

Example:

```
<!DOCTYPE html>
<html>
 <body>
        <h1 style="background-color: cyarn This Is A Heading Block Level Element</h1>
        <p style="background-color: fightcoral">This is a Paragraph block level element</p>
        <div style="background-color: springgreen">This is div block level element</div>
</body>
</html>
```

2. Inline elements: The inline elements take up only as much space as they need, and they do not start with a new line. Some commonly used inline-level elements include <a>, <img>,
, <sub>, <sup>, <b>, , <i>, , <button>, and <input>.

Block-level elements may contain other block-level or inline elements. But inline elements cannot contain block elements.

Example:

```
<!DOCTYPE html>
<html>
<body>
```

```
        <a href="https://www.shiksha.com/online-courses/">Shiksha Online Home Page</a>
        <span  style="background-color: steelblue">This inline elemmerit</span>
</body>
</html>
```

Empty HTML Elements: All elements do not require a closing tag. For example, the image <img> element does not need a closing tag. It uses attributes to specify content.

The elements in HTML that do not end tag and content are known as Empty elements or Void elements. The empty elements are self- closing and not container tags.

Some examples of Empty elements include <br>, <link>, <img>, <hr>, and <meta>.

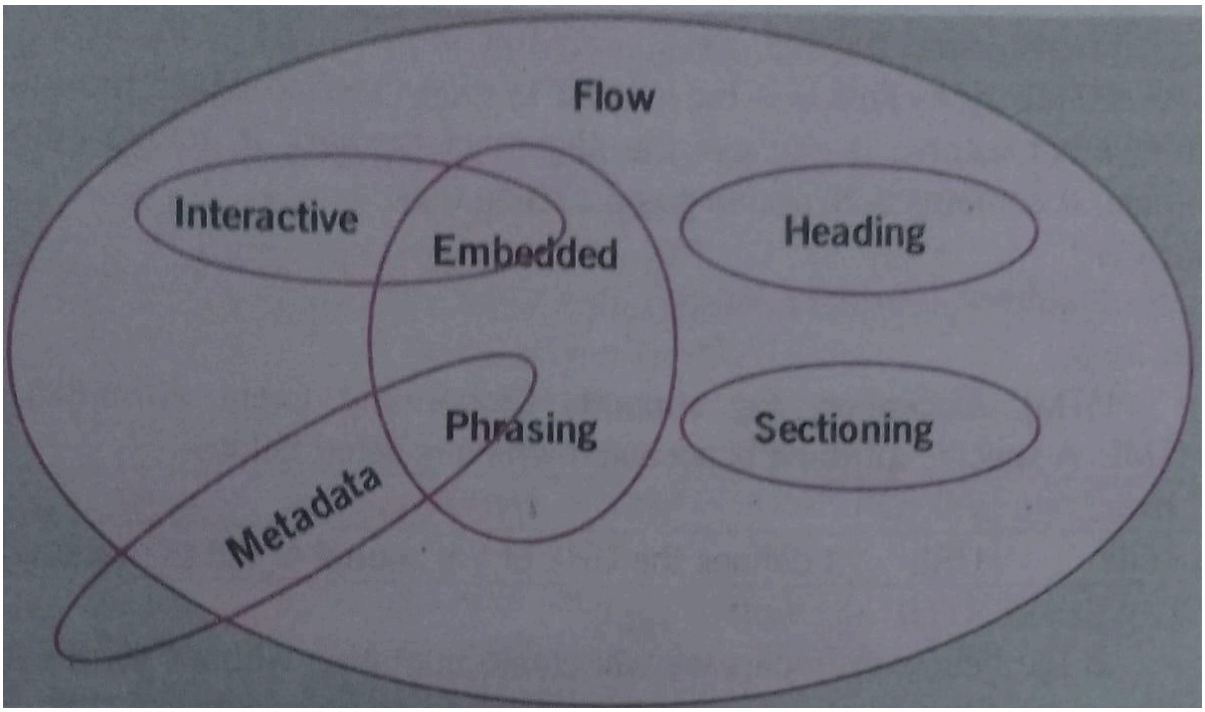
Nested HTML Elements: They can contain any number of additional elements. It means that one element can be placed inside another element. We can add multiple HTML tags to a single piece of content using nesting.

Example:

```
<!DOCTYPE html>
<html>
<body>
        <p> This is an example of <strong> Nested Elements </strong> </p>
 </body>
</html>
```

Explain the Content Model Categories in HTML.

Ans. Each element in HTML falls into zero or more categories that group elements with similar characteristics together. The following broad categories are used in this specification:



Flow Interactive
Embedded Heading
Metadata
Phrasing
Sectioning

1. Metadata content: Metadata content is content that sets up the presentation or

behaviour of the rest of the content, or that sets up the relationship of the document with other documents.

2. Flow content: Most elements that are used in the body of documents and applications are categorised as flow content. The only elements that are not considered flow elements are a subset of metadata elements. The older "block-level category roughly corresponds to this flow content category.

3. Phrasing content: Phrasing content is the text of the document, as well as elements that markup that text within paragraphs. The older "inline" category corresponds to phrasing content.

4. Sectioning content: Sectioning content is content that defines the scope of headers and footers.

5. Heading content: Heading content defines the header of a section.

6. Embedded content: Embedded content is content that imports another resource into the document.

7. Interactive content: Interactive content is content that is specifically intended for user interaction.

8. Palpable content: Elements whose content model allows any flow content or phrasing content should have at least one node in its contents that is palpable content and that does not have the hidden attribute specified.

9. Script-supported content: Script-supporting elements are those that do not represent anything themselves (i.e., they are not rendered), but are used to .support scripts, e.g., to provide functionality for the user.

Write a short note on block quote Element.

Ans: HTML <blockquote> tag is used to quate section which are taken from other source. It changes the alignment to make it unique arnong others. It contains both opening and closing tags.

Syntax: <blockquote> </blockquote>

Attribute: HTML blockquote tag supports Global and Event attributes of HTML. A specific attribute is accepted which is listed beloow.

Attributes	Values	Description
cite	URL	It defines the URL of the source of the quotation

Examples of HTML blockquote Tag:

In the bellow examples we will create quotation without source ite, with source cite and also deorate the quotation by using internal CSS.

Creating blockquote Text Element:

In the following example, let's see the usage of <blockquote> tag in the HTML documents.

```
<!DOCTYPE html>
<html> <body>
<h2>Blockquote example</h2>
        <blockquote>
        TutorialsPoint. Simply Easy Learning
        </blockquote>
</body>
</html>
```

Specifying quotation with Source: Considering the following example, we are creating an HTML

document and using the <blockquote> tag and its attribute "cite" to identify the quotation's source. <!DOCTYPE html>

```
<html>
 <body>
<h2>Blockquote example</h2>
  <blockquote cite="https://www.tutorialspoint.com"> TutorialsPoint: Simply Easy Learning
</blockquote>
</body>
</html>
```

Styling blockquote Element:

We are creating an HTML document and styling properties for style the blockquote element.

```
<!DOCTYPE html>
 <html>
<head>
 <style>
 blockquote ( color: green, font-style: italic: </style>
</head>
 <body>
 <h2>Blockquote example</h2>
        <blockquote cite="https://www.tutorialspoint.com">TutorialsPoint Easy to Learn!
 </blockquote>
</body>
 </html>
```

Discuss about Phrasing Elements in HTML.

Ans. In HTML, phrase tag is used to indicate the structural meaning of a block of text. For example, abbr tag indicates that the phrase contained the abbreviation word. Some examples of phrase tags are abbr, strong. mark,...etc.

1. Emphasized Text: Content that is enclosed within ... element is displayed as emphasized text. The element typically renders text in italics, indicating emphasis. Example:

```
<!DOCTYPE html>
<body>
        <p>The following word uses a <em>emphasized</em> typeface.</p>
</body>
 </html> Output:
```

The following word uses a emphasized typeface.

2. Marked Text: Anything that is enclosed with-in <mark>...</mark> element, is displayed as marked with yellow ink.

Example:

```
<!DOCTYPE html>
<html>
<body>
        <p>The following word has been <mark>marked</mark> with yellow.</p> </body>
</html>
```

Output:

The following word has been marked with yellow.

3. Strong Text: Content that is enclosed within ... element is displayed as important text. The element displays text in a bold font, indicating strong

importance. Example:

```
<!DOCTYPE html>
<html>
<body>
        <p>The following word uses a <strong>strong</strong> typeface.
</p>
</body>
</html>
```

Output:

The following word uses a strong typeface.

4. Abbreviation Text:

You can abbreviate a text by putting it inside opening <abbr> and closing </abbr> tags. If present, the title attribute must contain this full description and nothing else.

Example:

```
<!DOCTYPE html>
<html>
<body>
        <p>My best friend's name is <abbr title="Abhishek" >Abhy</abbr>.
 </p>
</body>
</html>
```

Output:

My best friend's name is Abhy.

6. Acronym Text: The <acronym> element allows you to indicate that the text between <acronym> and </acronym> tags is an acronym. At present, the major browsers do not change the appearance of the content of the <acronym> element.

The <acronym element is deprecated in HTML5. Instead, you should use the <abbr> element to define abbreviations, and you can specify the full description using the "title" attribute.

Example:

```
<!DOCTYPE html>
 <html>
<body>
   <p>This chapter covers marking up text in <acronym> XHTML </acronym>.
</p>
</body>
</html>
```

Output:

This chapter covers marking up text in XHTML.

7. Directed Text: The <bdo>...</bdo> element stands for Bi- Directional Override and it is used to override the current text direction.

Example:

```
<!DOCTYPE html>
<html>
<body>
        <p>This text will go left to right.</p>
```

```
        <p>
        <bdo dir="rtl">This text will go right to left.</bdo>
        </p>
</body>
</html>
```

Output:

This text will go right to left.

8. Special Terms: The <dfn>...</dfn> element (or HTML Definition Element) allows you to specify that you are introducing a special term. Its usage is similar to italic words in the midst of a paragraph.

Typically, you would use the <dfn> element the first time you introduce a key term. Most recent browsers render the content of a <dfn> element in an italic font. Example:

```
<!DOCTYPE html>
<html>
<body>
        <p>The following word is a <dfn>special</din> term. </p>
 </body>
</html>
```

9. Quoting Text: When you want to quote a passage from another source, you should put it in between

<blockquote>...</blockquote> tags

Text inside a <blockquote> element is usually indented from the left and right edges of the surrounding text and sometimes uses an italicized font.

Example:

```
<!DOCTYPE html>
<html>
<body>
        <p>The following description of XHTML is taken from the W3C Web site:</p>
         <blockquote>XHTML 1.0 is the W3C's first Recommendation for XHTML, following on
         from earlier work on HTML 4.01, HTML 4.0. HTML 3.2 and HTML 2.0.</blockquote>
</body>
</html>
```

Output:

The following description of XHTML is taken from the W3C Web site:

XHTML 1.0 is the W3C's first Recommendation for XHTML following on from earlier work on HTML 4.01, HTML 4.0, HTML 3.2 and HTML 2.0.

10. Short Quotations: The <q>...</q> element is used when you want to add a double quote within a sentence. By using <q>...</q>, you ensure that the enclosed text is presented as a direct quotation, enhancing readability and maintaining proper punctuation in your HTML document.

Example:

```
<!DOCTYPE html>
<html>
<body>
         <p>Armit is in Spain, <q>I think I am wrong</q>. </p>
</body>
</html>
```

Output:

Amit is in Spain, I think I am wrong.

11. Text Citations: If you are quoting a text, you can indicate the source placing it between an opening <cite>tag and closing </cite> tag As you would expect in a print publication, the content of the <cite> element is rendered in italicized text by default.

Example:

```
<!DOCTYPE html>
<html>
<body>
    <p>This HTML tutorial is derived from <cite>W3 Standard for HTML</cite></p> </body>
</html>
```

Output:

This HTML tutorial is derived from W3 Standard for HTML

12. Computer Code: Any programming code to appear on a Web page should be placed inside <code>...</code> tags. Usually the content of the <code> element is presented in a monospaced font, just like the code in most programming books.

Example:

```
<!DOCTYPE html>
<html>
<body>
    <p>Regular text. <code>This is code. </code> Regular text. </p>
</body>
</html>
```

Output:

Regular text. This is code. Regular text.

13. Keyboard Text: When you are talking about computers, if you want to tell a reader to enter some text, you can use the <kbd>...</kbd> element to indicate what should be typed in, as in this example. Example:

```
<!DOCTYPE html>
<html>
<body>
    <p>Regular text: <kbd>This is inside kbd element</kbd> Regular text </p>
</body>
</html>
```

Output:

Regular text. This is inside kbd element Regular text.

14. Programming Variables:

The <var> element is usually used in conjunction with the <pre> and <code> elements to indicate that the content of that element is a variable.

Example:

```
<!DOCTYPE html>
<html>
<body>
    <p> <code>document.write(" <var>user-name<var>") </code> </p>
</body>
</html>
```

Output:

document.write(" user-name")

15. Program Output: The <samp>...</samp> element indicates sample output from a program, and script etc. Again, it is mainly used when documenting programming or coding concepts.

Example:

```
<!DOCTYPE html>
<html>
<body>
    <p>Result produced by the program <samp>Hello World!</samp>
</p>
</body>
</html>
```

Output:

Result produced by the program is Hello World!

16. Address Text: The <address>...</address> element is used to contain any address. Example:

```
<!DOCTYPE html>
<html>
<body>
    <address>388A, Road No 22, Jubilee Hills - Hyderabad</address>
</body>
</html>
```

Output:

388A, Road No 22, Jubilee Hills - Hyderabad

Write a brief note on Editing Elements in HTML.

Ans. In HTML5, editing elements dynamically can be achieved through various methods, including the content editable attribute, using JavaScript for direct DOM manipulation, and employing frameworks or libraries.

1. Using the contenteditable Attribute:

The contenteditable attribute is a simple way to make HTML elements editable directly in the browser. Any element with this attribute set to true can be edited by the user.

```
<div contenteditable="true">
    You can edit this text.
</div>
```

2. Editing Elements with JavaScript:

For more control and functionality, you can use JavaScript to edit HTML elements. This can be done by directly manipulating the DOM. Example: Changing Text Content html

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial- scale=1.0'>
<title>Edit Elements</title>
</head>
<body>
<p id="editable-paragraph">This is a paragraph. </p> <button onclick="editParagraph()">Edit Paragraph</button>
    <script>
    function edit Paragraph() {
```

```
        const paragraph = document.getElementById('editable- paragraph');
        paragraph.textContent = 'The paragraph has been edited!
        }
        </script>
</body>
</html>
```

3. Form Elements and Input Fields:

You can also use form elements like <input>, <textarea>, and <select> to allow users to edit content. These inputs can be dynamically created and managed with JavaScript.

Example:

Creating an Editable Form

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initiat scale=1.0">
<title>Edit Elements</title>
</head>
<body>
<div id="content-div>This is some text </div>
<button onclick="makeEditable()">Edit Content</button>
        <script> function makeEditable() {
        const div = document.getElementById('content-div');
        const currentContent = div.textContent: div.innerHTML =
        <input type="text" id="edit-input value="$(currentContent}">
        <button onclick="saveContent()">Save</button>';
        }
        function saveContent() {
        const input = document.getElementById('edit-input'); const newContent =
        input.value; const div = document.getElementById('content-div);
        div.innerHTML = newContent;}
        </script>
</body>
</html>
```

4. Using JavaScript Libraries and Frameworks:

Libraries like jQuery or frameworks like React can simplify and enhance the process of editing HTML elements.

Example: **Using jQuery**

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial- scale-1.0">
<title>Edit Elements</title>
        <script src="https://code jquery.com/jquery-3.6.0.min.js"></script>
</head>
<body>
<p id="editable-paragraph">This is a paragraph.</p>
<button id="edit-button">Edit Paragraph</button>
```

```
 <script>
$(document).ready(function() {
$('#edit-button').click(function()
{ $('#editable-paragraph).text(The paragraph has been edited!);
</script>
</body>
</html>
```

Write about Code-Related Elements in HTML.

Ans. During web-site development, there is sometimes a need to display code. This could be a tedious task if we consider styling of the text to match the code's presentation. HTML Computer codes are displayed in a different text style and formatting in an HTML document. HTML5 provides a variety of elements to display computer codes. The <code> tag is the most widely used element.

HTML Computer Code elements: HTML code written within the following tags has a different font- size and style, as opposed to the normal headings and paragraphs.

1. HTML <code> tag: The <code> tag displays a specific computer code, and its content is displayed in fixed text-size, font-family. and spacing. We can style elements to match the computer's default text format.

Syntax:

```
<code> Computer Code </code>
```

For Example:

```
<!DOCTYPE html>
<html>
<body>
<h2>Computer Code</h2> <p>Programming code: </p>
        <code>
        x = 25;<br>
        y = 36,<br>
        z=x+y
        </code>
</body>
</html>
```

2. HTML <kbd> Tag: The <kbd> or, keyboard input element, defines the user-input or voice input. The text that should be typed is contained within the <kbd> tags and is displayed as mono-space. We can use CSS to obtain richer effects, but there are no tag specific attributes related to <kbd>.

Syntax:

```
<kbd>Key combination</kbd>
```

For Example:

```
<!DOCTYPE html>
<html>
<head>
<title>The kbd tag</title>
        <style> body {
```

```
        text-align:center;
        }
        </style>
</head>
 <body>
<div class="df">DataFlair</div> <kbd>Welcome to</kbd> <kbd>DataFlair</kbd>
<p> Press
<kbd>Ctrl+S</kbd> </p>
</body>
</html>
```

3. HTML <pre> tag: The <pre> tag of HTML allows the developers to display the text in the same format i.e., spaces, tabs, line breaks, etc as written in the code. We can style the text enclosed within the <pre> tag using CSS, yet it remains preserved in the browser.

Syntax:

```
<pre>Content</pre>
```

For Example:

```
<html>
<head>
<title>DataFlair</title>
 </head>
 <body>
<pre>
DataFlair
 Learn Today Lead Tomorrow. </pre>
```

4. HTML <samp> tag: This tag defines the sample output from a specific computer program i.e., a quoted output. The surrounded text displays in a monospace font. It is to display a quoted output from another source.

Syntax:

```
<samp>Content</samp>
```

For Example:

```
<!DOCTYPE html>
 <html>
<body>
 <h2>samp element</h2>
 <p>The samp element represents output from a program</p>
<p>For example, <samp>There is an Error!</samp></p>
</body>
</html>
```

5. HTML <var> tag: The variables in a mathematical equation or computer program can be explicitly displayed using the <var> element. It is usually in italics, by most of the browsers. Syntax:

```
<var>Content</var
```

> For Example

```
<!DOCTYPE html>
```

```
<html>
 <body>
<h2>Planck's Equation</h2>
<p>According to Planck's Equation <var>E</var> = <var>hf</var></p>
 </body>
</html>
```

Explain the sup, sub, s, mark, and small Elements in HTML.

Ans. Sup element: HTML <sup> tag defines inline content that should be rendered as superscript. Superscripts are usually rendered with a raised baseline using smaller text. HTML <sup> tag is used for displaying exponents, such as "x3" and representing ordinal numbers, such as "4th".

The <sup> tag should be used only for typographical reasons that is, to adjust the position of the text to comply with typographical rules or standards rather than for presentation or appearance.

Syntax:

```
<sup>    </sup>
```

Attribute:

HTML sup tag supports Global and Event attributes of HTML.

Example:

```
<!DOCTYPE html>
<html>
<head>
<title>HTML sup Tag</title>
<style>
        body
         {
          text-align: center;
         }
          </style>
 </head>
<body>
<h2>Example of sup tag</h2>
 Following is the famous Pythagorean Theorem:
<p   style=”font-size:    20px;   color; green;">
<var>a</var><sup>2</sup>+<var>b</var><sup>2</sup>=<var>c</var><sup>2</sup>
</p>
<p>Where a, b, and c represents the sides of right angle triangle</p>
 </body>
</html>
```

sub element:

HTML <sub> tag defines inline coritent that should be rendered as subscript. Subscripts typically appear with a lower baseline and smaller font. Subscript text is commonly used for chemical formulas, like H2O, which is written as H2O.

The <sub> element should be used for typographical reasons that is, to adjust the position of the text to comply with typographical rules or standards rather than for presentation or appearance. Syntax:

```
<sub> </sub>
```

Attribute:

HTML sub tag supports Global and Event attributes of HTML

Example

```
<!DOCTYPE html>
<html>
<head>
<title>Sub Tag</title>
        <style>
        body { text-align: center;color;
        }
        p{
        color: green;
        }

        </style>
</head>
<body>
 <h2>Example of sub tag</h2>
<p>The chemical formula for H<sub>2</sub>SO<sub>4</sub></p>
Sulphuric acid 1s:
</body>
 </html>
```

s element:

HTML <s> tag is use to represent the content that is no longer correct or accurate. It stands for strikethrough tag and useful to render text with a strikethrough, or a line through it.

It is recommended to use the <del> tag instead of the <s> tag to define deleted text in a document.

Syntax:

```
<S>    </s>
```

Attribute:

HTML s tag supports Global and Event attributes of HTML.

Example:

```
<!DOCTYPE html>
<html>
<head>
<title>HTMI. s tag</tille>
        <style>
        body  {  text-align:
        center;} s{
         color, green;
        </style>
 </head>
 <body>
<h2>Example of s tag</h2>
```

```
<p><s>The last date of apply for online classes is 12/02/2019</s> </p>
<p>The last date of apply for online classes is 13/03/2019</p>
</body>
</html>
```

mark element:

HTML <mark> tag is used to mark or highlight text that is important for notation purposes due to the marked passage's relevance in the enclosing context. By default, the <mark> tag highlights the text in the yellow background, and this tag is new in HTML 5.

Don't use the <mark> tag for syntax highlighting purposes; instead of <mark>, we can use the tag with appropriate CSS applied to it.

Syntax:

```
<mark>      </mark>
```

Attribute:

HTML mark tag supports Global and Event attributes of HTML.

Example:

```
<!DOCTYPE html>
<html>
<head>
 <title>Mark Tag</title>
</head>
<body>
 <h2>Exmapte of Mark Tag</12 >
<p>You can easily designing a website with our
<mark>Web designing <mark></p>
</html>
```

small element:

HTML <small> tag makes text font by one size smaller than the documents base font size (Such as large to medium, medium to small, etc.)

In HTML5, <small> tag is used for identifying secondary importance such as copyright, side comments, and legal notices.

Syntax:

```
<small>Write your content here….<small>
```

Example:

```
<!DOCTYPE html>
 <html>
 <head>
<title>HTML small tag</title>
</head>
 <body> <
h2>Example of small tag</h2>
<p style="color: green,> This is normal font size
<small style="color: blue;">It is smaller than previous...
<small style="color: red;">It is smallest </small>
</small>
```

</p>
</body>
</html>

Write a short note on strong, em, b, u, and i Elements.

Ans. strong element: HTML tag is used for making the text strong that has more importance and the text inside it is typically displayed in the bold.

If we are writing content within a paragraph or any element, but an important term comes up in the content, we can use the tag to make the important words bold.

Syntax:

 Attribute:

HTML strong tag supports Global and Event attributes of HTML.

Example:

```
DOCTYPE html>
 <html>
 <head >
<title>Strong tag<title>
          <style> h1,hè{
          text-allign center ;
          }
          h2 {
          color, green;
          }
          </style>
 </head>
<body>
 <h1>Example of strong tag</h1> <h2>Weather forecasting</h2>
 <p>The weather is not good today.
 <strong>It may heavy rain today, so it will better to be in your home. </strong>
</p>
</body>
</html>
```

em element:

BnHTML tag stands for "emphasis element". It gives semantic meaning to the text contained within it and renders it in italics on the browser. The tag represents their content similarly to the <i> tag; the difference between the two tags is that the element semantically emphasizes the important word while the <i> element is just offset text conventionally styled in italic.

Syntax:

Attribute:

HTML em tag supports Global and Event attributes of HTML.

Example:

```
<!DOCTYPE html>
 <html>
<head> <title>Em Tag</title>
          <style> h2{
          color: #117150;
           </style>
</head>
 <body>
 <h2>Example of em Tag</h2>
<p>This is <em>HTML em tag</em> and it well emphasis the <em>important text</em> of the sentence-</p>
</body>
 </html>
```

b element:

HTML <b> tag is used to highlight the text and specify the text in bold. The purpose of the <b> tag or element is to draw attention to the contents of the element, which are not normally given special importance.

If we are writing content within a paragraph element but an important word comes in the content, we can use the <b> tag to highlight the important word.

Syntax:

```
<b> ... </b>
```

Attribute:

HTML b tag supports Global and Event attributes of HTML. Example:

```
 <!DOCTYPE html>
<html>
 <body>
 <p>This is normal para</p>
<p>
<b>This is bold paragraph </b>
</p>
</body>
</html>
```

u element:

HTML <u> tag is used to create underline text. This tag is generally used to underline incorrect or misspelt words. Syntax:

```
<u>... </u>
```

Attribute:

HTML u tag supports Global and Event attributes of HTML.

Example:

```
<!DOCTYPE html>
<html>
<head>
<title>HTML u tag</bitle>
        <style> u {
         text-decoration, red wavy undertine;}
        </style>
</head>
<body>
<h2>Example of u tag</h2>
<p>This fag can be useful to identifying <u>spelling mistakes </u>in an document </p>
</body>
</html>
```

i element:

HTML <i> tag is used to display the content in italic style is generally used for the important words in the different languages and also for the technical terms. If we are writing content within a paragraph element but an important word or different language comes in the content, we can use the <i> tag to highlight the important word.

Syntax:

```
<i> content </i>
```

Attribute:

HTML i tag supports Global and Event attributes of HTML.

Example:

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Tag</title>
        <style> P{
        color: #e9967a;
        }
        i{
        color: green; }
        </style>
</head>
<body>
<h2>Example of HTML i tag</h2> <p>John and his team is ready for his new gaming project
<i>Marko Series 3</i></p>
</body>
</html>
```