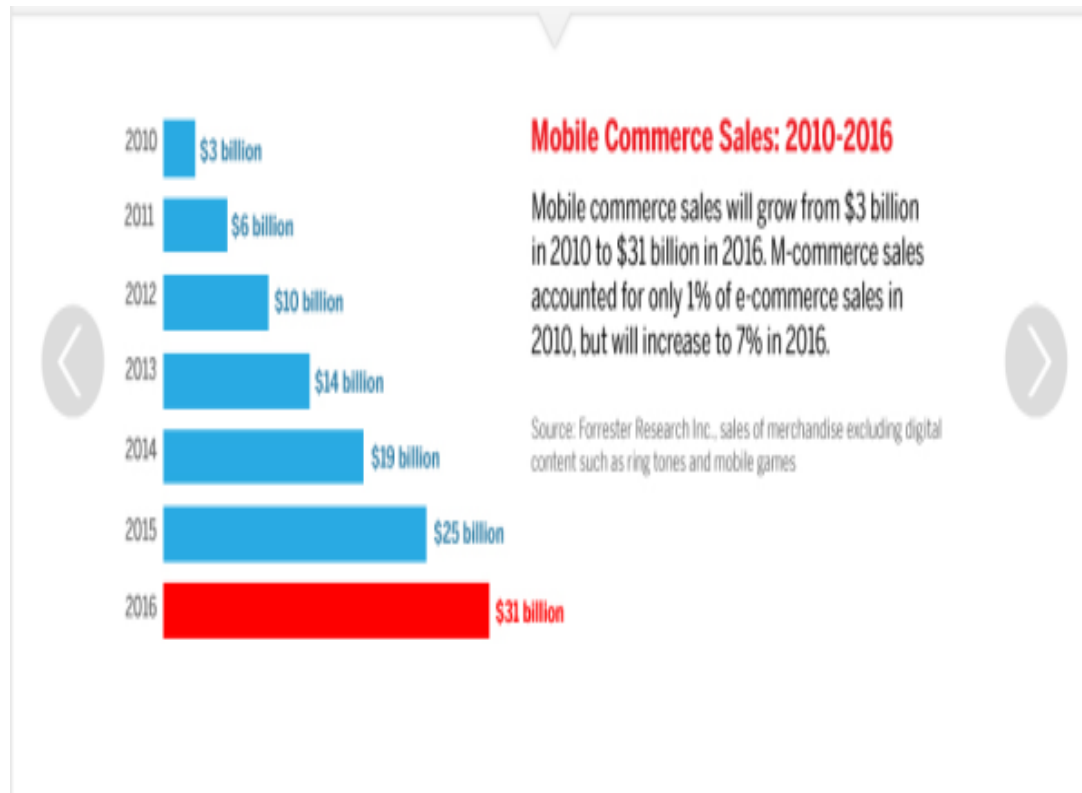


Mobile Commerce

- **Mobile e-commerce (m-commerce)** is a term that describes online sales transactions that use wireless **electronic** devices such as hand-held computers, **mobile** phones or laptops. These wireless devices interact with computer networks that have the ability to conduct online merchandise purchases.



Web World (E-commerce)	Mobile World (M-commerce)
Access of internet is necessary for e-commerce.	M-commerce connectivity is launched as a wireless connectivity using mobile devices.
Buying and selling products and services with the use of internet.	Buying and selling products and services with the use of mobile phones that have access to internet or cellular data.
Requires devices such as computers, laptops, and so on.	Requires devices such as cell phones, iPads, tablets, and so on.
Platform used: Web Stores	Platform used: Web stores (mobile version/web app), hybrid app, native app
Mobility is limited as you cannot carry computers everywhere. Even if you use laptops, you have to find the enough space to access it. Though it is portable, it is not as light as mobile phones.	Since mobile devices are easy to carry it offers more mobility, accessibility, and convenience.
Less costly as created on the web store platform and there is a usage of internet.	More costly as a mobile app is required and there is a usage of cellular data or internet.
Since, it is applicable to the broader area, customization for each user is not possible.	Mobile devices are usually owned by individual, so anyone can use the customized app to fulfill their business needs or personal.
More complicated user interface and more functions available.	Simple usage because all the functions are simplified.

Features of M-commerce

- Creates opportunity to deliver new services to existing customers and to attract new customers.
- Allows direct access to get information about the product.
- Can be done via the internet, private communication lines, smart cards etc.



Feature of M-Commerce

Ubiquity

Easier information access in real-time

Communication independent of the user's location

Convenience

Devices that store data are always at hand

Getting easier and easier to use

Localization

Knowing where the user is located at any particular moment

Match services to their location

Personalization

Preparation of information

Creating services that customize the end-user experience

Accessibility

Contacted anywhere anytime

The choice to limit their accessibility to particular persons or times.

Mobile commerce (m-commerce) is an emerging discipline involving applications, **mobile** devices, middleware, and wireless networks. ... In addition to device and wireless constraints, **mobile commerce** would also be impacted by the dependability of wireless **infrastructure**.

E-Commerce and M-Commerce Technology Infrastructure

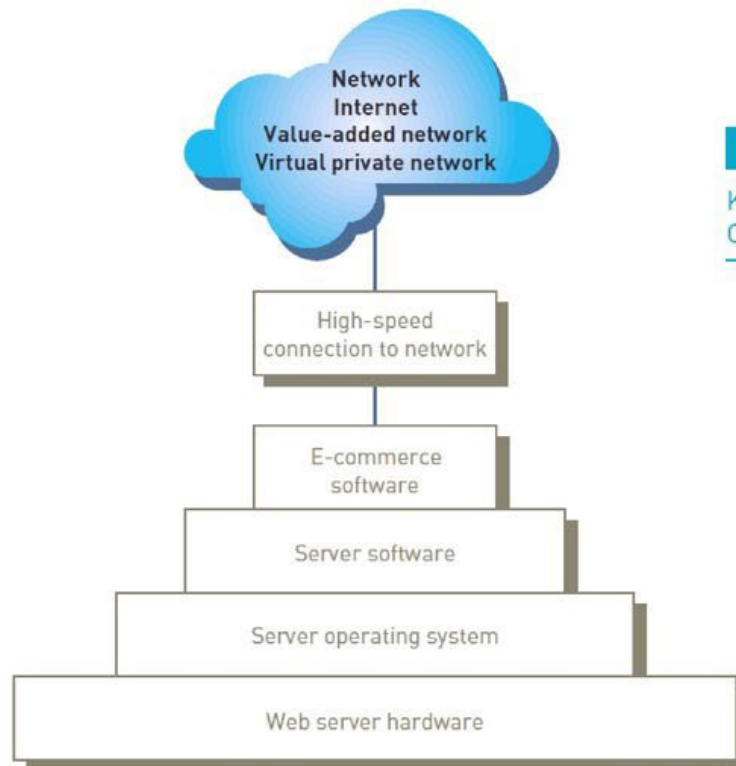


Figure 5.2

Key Technology Infrastructure
Components

Mobile Computing Infrastructure

- Cellular (mobile) phones
- Attachable keyboard
- PDAs
- Interactive pagers
- Other devices
 - **Notebooks**
 - **Handhelds**
 - **Smartpads**
- Screenphones—a telephone equipped with color screen, keyboard, e-mail, and Internet capabilities
- E-mail handhelds
- Wirelined—connected by wires to a network

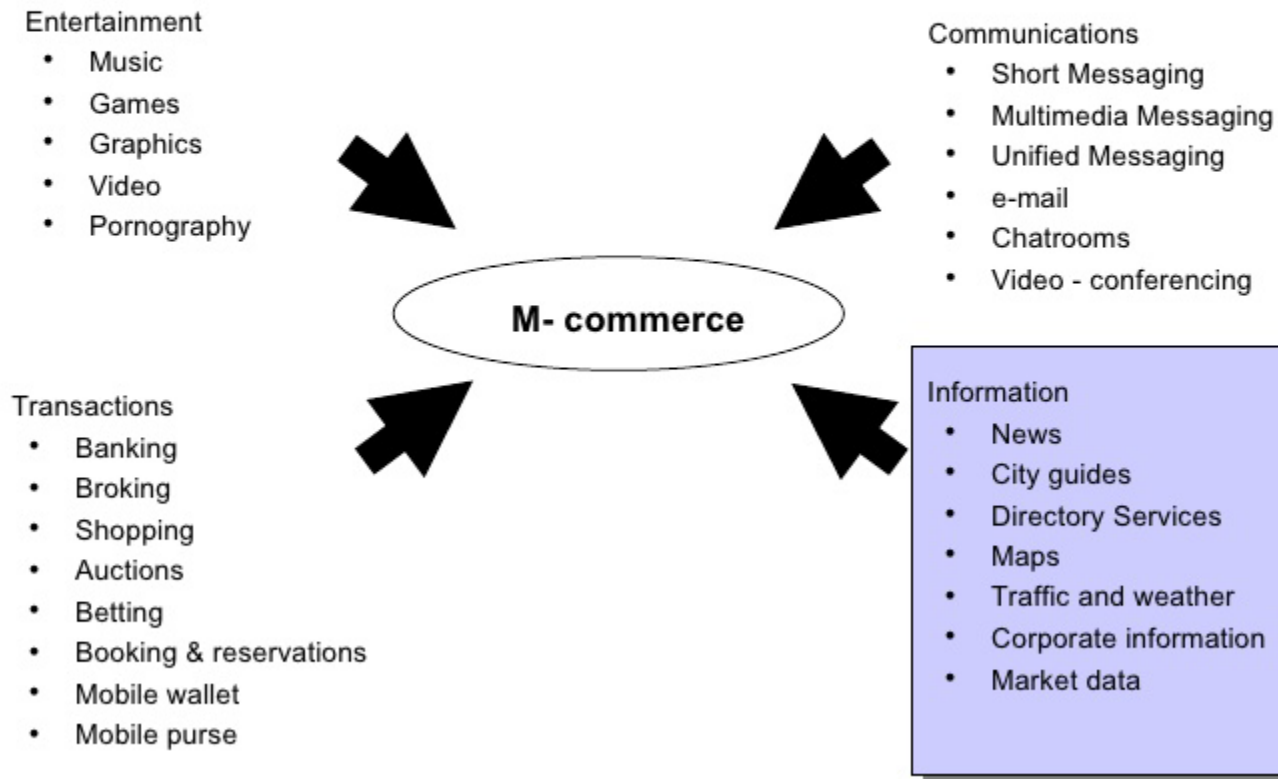
Mobile Computing Infrastructure

- Software
 - Microbrowser
 - Mobile client operating system (OS)
 - Bluetooth—a chip technology and WPAN standard that enables voice and data communications between wireless devices over short-range radio frequency (RF)
 - Mobile application user interface
 - Back-end legacy application software
 - Application middleware
 - Wireless middleware

Mobile Service Scenarios

- Financial Services.
- Entertainment
- Shopping.
- Information Services.
- Payment.
- Advertising.
- And more ...

Early content and applications have all been geared around information delivery but as time moves on, the accent will be on revenue generation.



Classes of M-Commerce Applications

Exhibit 8.2 Classes of M-Commerce Applications

Class of Applications	Examples
Mobile financial applications (B2C, B2B)	Banking, brokerage, and payments for mobile users
Mobile advertising (B2C)	Sending user-specific and location-sensitive advertisements to users
Mobile inventory management (B2C, B2B)	Location tracking of goods, boxes, troops, and people
Proactive service management (B2C, B2B)	Transmission of information related to distributing components to vendors
Product locating and shopping (B2C, B2B)	Locating/ordering certain items from a mobile device
Wireless reengineering (B2C, B2B)	Improvement of business services
Mobile auction or reverse auction (B2C)	Services for customers to buy or sell certain items
Mobile entertainment services (B2C)	Video-on-demand and other services to a mobile user
Mobile office (B2C)	Working from traffic jams, airport, and conferences
Mobile distance education (B2C)	Taking a class using streaming audio and video
Wireless data center (B2C, B2B)	Information can be downloaded by mobile users/vendors
Mobile music/music-on-demand (B2C)	Downloading and playing music using a mobile device

Source: U. Varshney and R. Vetter, "Recent Advances in Wireless Networking," *IEEE Computer*, June 2000.
© 2000 IEEE.

Mobile Applications: Financials

- As mobile devices become more secure these applications will become more viable
 - Mobile banking
 - Bill payment services
 - M-brokerage services
 - Mobile money transfers
 - Mobile micropayments
- Replace ATM's and credit cards??

Mobile Payment

- the consumer must be informed of:
 - what is being bought, and
 - how much to pay
 - options to pay;
- the payment must be made
- payments must be traceable.

Mobile Payment

Customer requirements:

- **a larger selection of merchants with whom they can trade**
- **a more consistent payment interface when making the purchase with multiple payment schemes, like:**
 - **Credit Card payment**
 - **Bank Account/Debit Card Payment**

Merchant benefits:

- **brands to offer a wider variety of payment**
- **Easy-to-use payment interface development**

Bank and financial institution benefits

- **to offer a consistent payment interface to consumer and merchants**

Limitations of M-Commerce

- Usability Problem
 - small size of mobile devices (screens, keyboards, etc)
 - limited storage capacity of devices
 - hard to browse sites
- Technical Limitations
 - lack of a standardized security protocol
 - insufficient bandwidth
 - 3G licenses

Limitations of M-Commerce

- Technical Limitations...
 - transmission and power consumption limitations
 - poor reception in tunnels and certain buildings
 - multipath interference, weather, and terrain problems and distance-limited connections
- WAP Limitations
 - Speed
 - Cost
 - Accessibility

Types of Mobile Commerce Services

Mobile shopping. ...
Mobile **banking**. ...
Mobile payments. ...
Better overall experience for customers. ...
Phenomenal growth potential. ...
A true omni-channel experience. ...
Variety of payment options. ...

1. Entertainment

2. Marketing Advertising

3. Banking & bill payment

4. Ticketing.

5. Retail & peer to peer.

Technologies For M-Commerce/Wireless Business

1. **i-Mode:** It is the packet-based service for mobile phones offered by Japan's leader in wireless technology, NTT DoCoMo. The i-mode protocol uses compact HTML (cHTML) as its markup language instead of WAP's wireless markup language (WML) to provide mobile phone voice service, Internet, and e-mail.
- 2 **Short Message Service (SMS):** It has grown very rapidly and is very popular in Europe. SMS messages are two-way alphanumeric paging messages up to 160 characters that can be sent to and from mobile phones
- 3 **The Third Generation (3G):** It will bring wireless transmission speeds up to 2Mbps, which permits high-quality wireless audio and video. It comprises three primary standards: W-CDMA (wide-band code division multiple access), CDMA2000, and TD-CDMA (time division CDMA).
- 4 **The WAP: (Wireless Application Protocol)** A standard for providing cellular phones, pagers, and other handheld devices with secure access to e-mail and text-based Web pages.

- 5. Wi-Fi (Wireless Fidelity):** It is a popular term for 802.11b, a wireless local area network (WLAN) specified by the Institute of Electrical and Electronic Engineers (IEEE) and is based on the Ethernet protocol and CSMA/CA (carrier sense multiple access with collision avoidance) for path sharing. Wi-Fi supports a range of about 150 feet and data rates up to 11mbps.
- 6. WiMax (worldwide interoperability for microwave access):** It is called 802.16 in industry standard, a wireless broadband connection in wide area network(WAN). It offers fast wireless data communications over distance up to about 30 miles.
- 7. Wireless Application Protocol (WAP):** It is an open, global specification that empowers mobile users with wireless devices to easily access and interact with information and services instantly.

8. Local Area Network Technologies

- IEEE 802.11 and IEEE 802.11b are established wireless standards commonly used with laptops or personal computers for wireless local area networks. This technology provides speeds of 1 to 11 megabits per second (Mbps). Bluetooth is a relatively new, inexpensive short-range wireless standard that allows different devices (such as laptops and mobile phones) to communicate with each other. The maximum distance between devices is about 100 meters, and data exchange rates are 1 to 2 Mbps. Hiper LAN is a set of wireless LAN standards, primarily used in Europe, which provides speeds up to 20 Mbps.

9. Telecommunications Technology

There are three basic “second-generation” (2G) digital wireless telephone technologies – time division multiple access, Global System for Mobile communication (GSM), and code-division multiple access. All these are circuit-switched services, where a user must dial-in and maintain a connection when data communications are desired. GSM is the most widely used of the three technologies, especially in Europe; its current speed is only 9.6 kilobits per second (Kbps).

10. A radio frequency (RF)

signal refers to a **wireless** electromagnetic signal used as a form of **communication**, if one is discussing **wireless** electronics. **Radio waves** are a form of electromagnetic radiation with identified **radio frequencies** that range from 3kHz to 300 GHz.

11. IEEE(Institute of Electrical and Electronics Engineers.)

IEEE 802.11 refers to the set of standards that define communication for wireless LANs (wireless local area networks, or WLANs). The technology behind 802.11 is branded to consumers as Wi-Fi.

- As the name implies, IEEE 802.11 is overseen by the IEEE, specifically the IEEE LAN/MAN Standards Committee (IEEE 802).

12. IR Infrared (IR)

is a wireless mobile technology used for device **communication** over short ranges. ...

In fact, **Infrared Data** Association (IrDA) device **communication** is usually exchanged on a one-to-one basis. Thus, **data** transmitted between IrDA devices is normally unencrypted.

13. Bluetooth:

A **Bluetooth technology** is a high speed low powered wireless **technology** link that is designed to connect phones or other portable equipment together. It is a specification (IEEE 802.15.1) for the use of low power radio communications to link phones, computers and other network **devices** over short distance without wires.

Benefits of M-Commerce

- **1 Faster purchases:** many sites have mobile versions, though apps are generally 1.5 times faster when loading data and search results on mobile devices. Moreover, there is no need to pull data from a server and so customers can browse and purchase products faster.
- **2. Better customer experience:** People are well familiar with how smart phones and tablets work, so they already know how to navigate to desired products in few clicks. In addition to purchases, customers can share their joy of bought goods with friends, or ask for advice from community of shopaholics. Smooth customer experience equals better conversion rates and revenue.
- **3. Direct connection to customers (push notifications):**
- This is something that is impossible with a website. Of course, one may send email messages about new products or seasonal sales, but that channel loses badly to direct customer notifications via mobile app. Push notifications are both instant and unobtrusive at the same time, that's a truly nice option for businesses. And one of the major reasons to have a brand ecommerce app.

4. **Tailored content:** Based purely on individual preferences and shopping patterns with a mobile app you can deliver personalized content to customers. And they love it (if you don't overdo it, surely). User location, interests, social media profiles, items viewed, etc. all can be utilized to bring people what they need.
5. **Deeper analytics:** Knowing your customers equals prosperity in business these days. Knowing customers demands data, at least very basic information like age, sex, location, shopping history. Within your mobile app you may build and set user analytics of various levels of sophistication. It depends on your business strategy and a budget available to make an app.
6. **Store navigation/geo location:** Mobile apps have a much better competitive (technical) in regard to marketing opportunities. Front and back camera, scanning codes, positioning system for location, compass, accelerometer, gyroscope and other build-in features can be used for commercial purposes.

Limitations Of M-Commerce

1. Band Width
2. Screens Size
3. Less powerful Processor
4. Cost of Wireless Connection.

Mobile Marketing

- **Mobile marketing** is the interactive multichannel promotion of products or services for **mobile** phones and devices, smart phones and networks. **Mobile marketing** channels are diverse and include technology, trade shows or billboards.

Definition

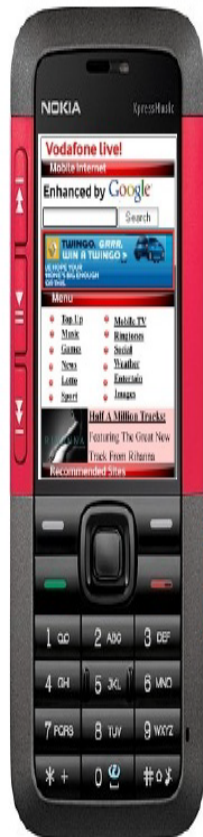
- Mobile marketing is broadly defined as the use of the mobile medium as a means of IMC communication. It distributes any form of promotional or advertising messages to customers predominately through wireless networks.

Mobile Advertising

What is Mobile Advertising?



What is Mobile Advertising?



It's a collection of mobile channels suitable for advertising such as:

Mobile WAP banners

SMS advertising

MMS advertising

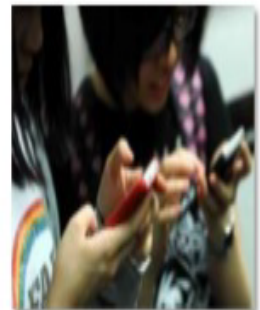
Advertising in games and videos

What it's NOT!

Mobile Advertising is not about SMS SPAM

Multiple needs and objectives:

- New tool for brands and advertisers to reach new customers and target specific audiences
- Connectivity promotes marketing success
- Build customer database
- Lifestyle integration



Benefits of Mobile Advertising

1. Personal
2. Measurement.
3. Fraud Resistance.
4. Instant Result.
5. Cost less.
6. Location Targeting.
7. Easy to work.

Marketers cite a common set of benefits and challenges with mobile advertising

Benefits:

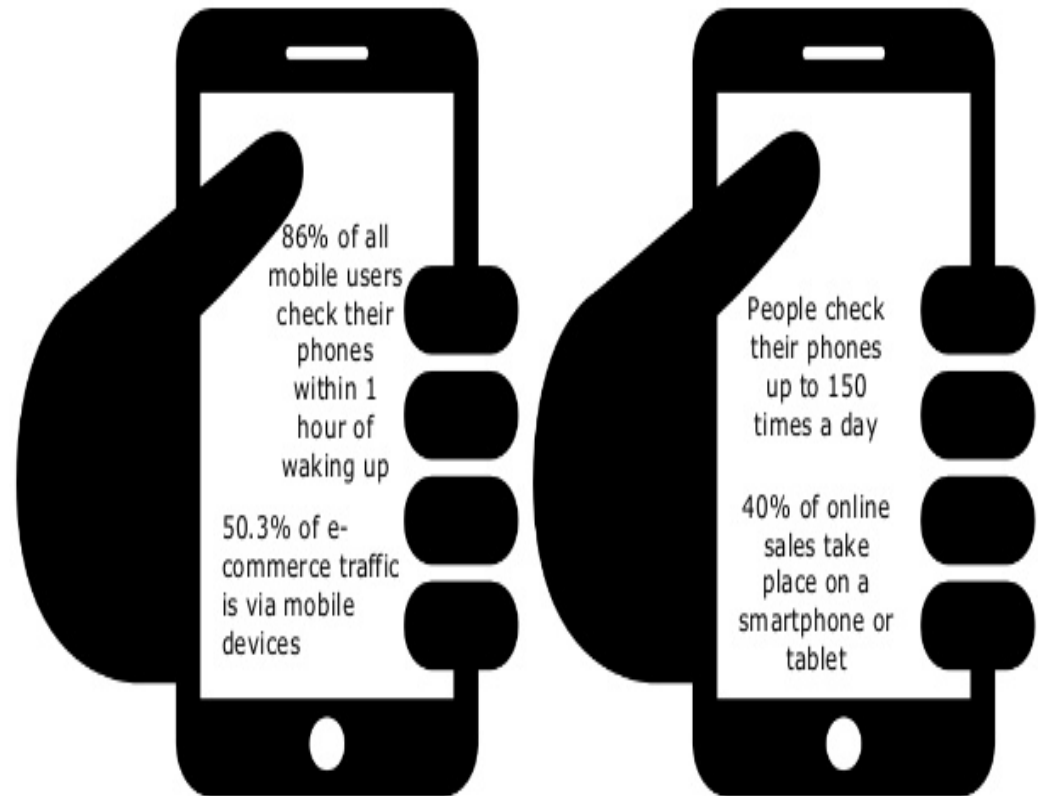
- **Enhanced targeting and personalization**
 - Geographic
 - Audience
 - Device
 - Location
- **Increased reach**
- **Cost-effectiveness**
- **Greater immediacy and interactivity**

Challenges:

- **Device and OS fragmentation**
- **Lack of standardization**
 - Ad formats
 - Success metrics
- **Lack of strategic and tactical expertise**
- **Difficulty demonstrating ROI**
- **Privacy issues**

www.eMarketer.com

The Value of Mobile



digital clarity

Limitation of Mobile Advertising

1. Some time slow accessibility.
2. Technology not improved some places.
3. Data transfer slow
4. Privacy issue.
5. Slow transmission speed.
6. Network error.

Types of Mobile Marketing & Advertising

- Mobile web poster
- SMS Advertising
- MMS Advertising
- Mobile Games
- Mobile Videos
- Audio Advertising.

Mobile Commerce Applications:

1. Consumer-Based: Refers to normal daily commerce activities that are most likely to be conducted by anyone who is a user of a wireless device.

Eg: Receiving stock prices, finding restaurants, getting driving directions, shopping online.

2. Business based: Refers to business applications that are applied in a corporate or business environment to facilitate business transactions and to improve productivity within a company.

Mobile Commerce Statistics

- Revenue impact for the retail industry.
- Mobile conversion increased 30% from 2015 to 2016.
- In 2012, mobile sales accounted for 10% of total purchases across BC stores
- In 2016, mobile commerce sales accounted for 31% of total purchases
- Same store mobile commerce growth stats by country .
- U.S. businesses – 24% growth.
- Australia & New Zealand businesses – 33% growth.
- European businesses – 18%.
- Canadian businesses – 19%.
- Asia-based businesses – 42%.
- Other – 30%.

Applications of M-commerce

- **Mobile Banking:** Using a mobile website or application to perform all your banking functions. It is one step ahead of online banking and has become commonplace these days. For example, in Nigeria, the majority of banking transactions happen on mobile phones.
- **Mobile Ticketing and Booking:** Making bookings and receiving your tickets on the mobile. The digital ticket or boarding pass is sent directly to your phone after you make the payment from it. Even in India now IRTC and other services provide m-ticketing services.
- **E-bills:** This includes mobile vouchers, mobile coupons to be redeemed and even loyalty points or cards system.
- **Auctions:** Online auctions having now been developed to be made available via mobile phones as well.
- **Stock Market Reports** and even stock market trading over mobile applications.

Customer Relationship Management (CRM)

- **CRM:** or Customer Relationship Management is a strategy for managing an organization's relationships and interactions with customers and potential customers. A CRM system helps companies stay connected to customers, streamline processes, and improve profitability.
- **What does CRM software do?**
- CRM software records customer contact information such as email, telephone, website social media profile, and more. It can also automatically pull in other information, such as recent news about the company's activity, and it can store details such as a client's personal preferences on communications.

Mobile Payment

- **Mobile payment** (also referred to as **mobile** money, **mobile** money transfer, and **mobile** wallet) generally refer to **payment** services operated under financial regulation and performed from or via a **mobile** device.
- Mobile Payment Methods:
 - 1. Direct Cash
 - 2. Cheque.
 - 3. Credit Card.
 - 4. Bank Transfer.
 - 5. Debit Advice.

Basis Of E-Payment

- **Basis of payment:** Mobile payment methods currently in use or under trial may be classified according to the basis of payment.
- **Account –Based:** Every consumer is associated with a specific account maintained by an Internet Payment Provider (IPP)
- **Token –Based:** The alternative to maintaining an account for each consumer is to use electronic token. In token based payment methods, consumers typically need to convert actual currency to their electronic equivalent tokens.

- Timing of Payment:

Mobile payment can be made at different times:

- Real-Time
- Pre-paid
- Post-paid
- Medium of payment.
- Mobile payment by bank account or credit card.
- Mobile payment by phone bill.

Functional modules of mobile payment system:

1. Transaction platform.
2. Control of communicating interface.
3. Query and statistics for service states.
4. Statistic & analysis for business.
5. System monitor and control.
6. Charge account.
7. Customer service.
8. Database.

Categorization of M-Payment System

- 1. **Software electronic Coins:** Electronic money stored on the mobile device in file format.
- 2. **Hardware electronic Coins:** Electronic money stored on the mobile device on a smart card.
- 3. **Background account:** electronic money stored in a remote account at a trusted third party.

Service & Application of Mobile Commerce

1. Mobile Ticketing:
 - a) Airline ticketing
 - b) Cinema ticketing
 - c) Railway & bus ticketing
 - d) Concert / Event ticketing
 - e) Consumer Voucher Distribution.
2. Mobile Money Transfer
3. Content purchase and delivery.
4. Information Services:
 - a) Traffic reporting.
 - b) Sports scores.
 - c) News
5. Mobile banking:
 - a) Mini-statement and checking of account history.
 - b) Checking the balance.
 - c) Recent transactions
 - d) PIN Provision, change of PIN.
 - e) Mobile Purchase.

MOBILE WALLET: The Definition

A mobile wallet is a way to carry credit or debit card information in a digital form, on a mobile device. Instead of using a physical plastic card (or cash) to make purchases, users can pay with a smartphone, tablet, or smartwatch.

It may also be referred to as '*mobile money*', or '*mobile money transfer*' (when sending and receiving money).

- Mobile wallet payment options:
 1. Prepaid.
 2. Post-Paid.
 3. Card Linked mobile wallet.



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