

Mobile Computing

eCommerce

Definition of Mobile Computing

- DEFINITION : The ability to use technology in remote or **mobile** (non static) environments. This technology is based on the use of battery powered, portable, and wireless **computing** and communication devices, like smart**mobile** phones, wearable computers and personal digital assistants (PDAs).
- **Mobile computing** a generic term describing one's ability to use technology untethered, but often used to refer to access to information or applications from occasionally-connected, portable, networked **computing** devices.

Advantages of Mobile Computing

- 1 - **Increase in Productivity** - Mobile devices can be used out in the field of various companies, therefore reducing the time and cost for clients and themselves.

- 2 - **Entertainment** - Mobile devices can be used for entertainment purposes, for personal and even for presentations to people and clients.

Advantages of Mobile Computing

3 - Portability - This would be one of the main advantages of mobile computing, you are not restricted to one location in order for you to get jobs done or even access email on the go.

4 - Cloud Computing - This service is available for saving documents on a online server and being able to access them anytime and anywhere when you have a connection to the internet and can access these files on several mobile devices or even PCs at home.

Disadvantages of Mobile Computing

- 1- **Quality of connectivity** - mobile devices will need either WiFi connectivity or mobile network connectivity such as GPRS, 3G and in some countries even 4G connectivity because if you are not near any of these connections your access to the internet is very limited.
- 2- **Security concerns** - Mobile VPNs are unsafe to connect to, and also syncing devices might also lead to security concerns. accessing a WiFi network can also be risky because WPA and WEP security can be bypassed easily.

- 3- **Power Consumption** - due to the use of batteries in these devices, these do not tend to last long, if in a situation where there is no source of power for charging then that will certainly be a let down.

Issue Surrounding the mobile computing technology

1 - Disconnections

- Resources can be allocated to handle disconnections more elegantly, or to try and prevent those disconnections from happening.

2 - Low Bandwidth and Bandwidth Variability

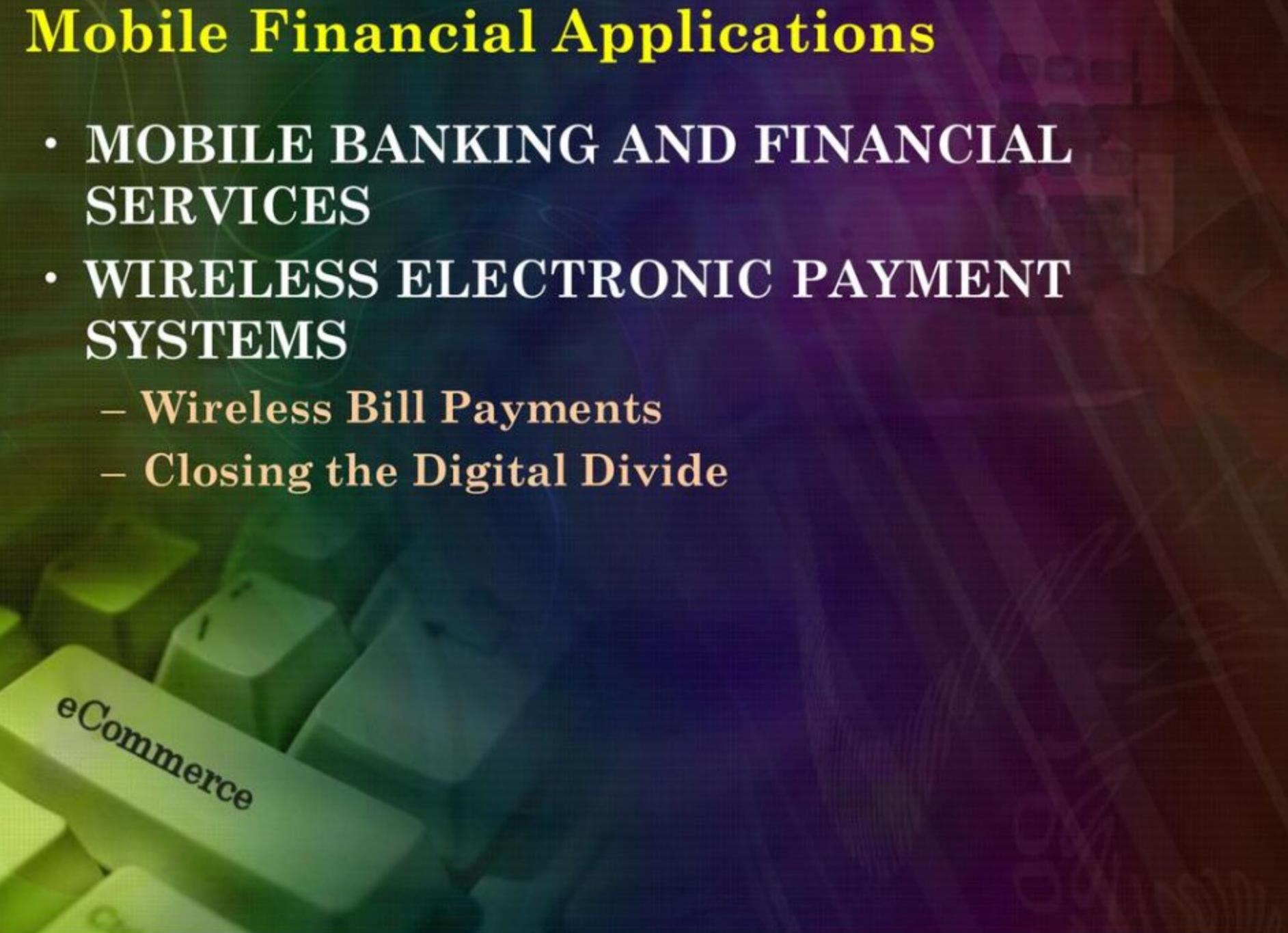
- Wireless networks deliver lower bandwidth than wired networks, hence mobile computing designs need to be very concerned about bandwidth consumption.

3- Security Concerns

- This is further complicated if users are allowed to cross security domains, for example in a large firm where sensitive data accessible to only authorised personnel and other data that is freely accessible to anybody with a mobile computer.

Mobile Financial Applications

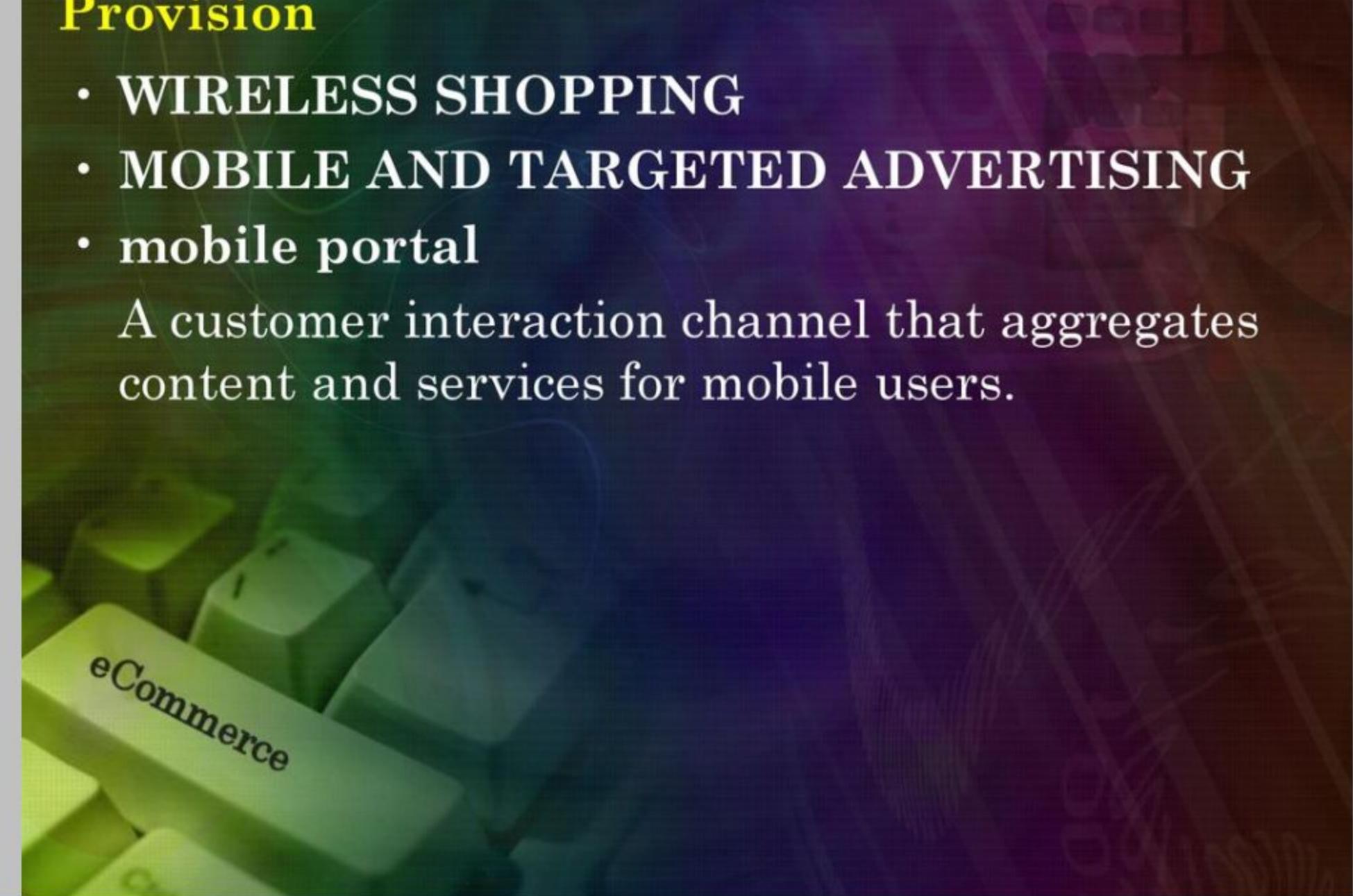
- MOBILE BANKING AND FINANCIAL SERVICES
- WIRELESS ELECTRONIC PAYMENT SYSTEMS
 - Wireless Bill Payments
 - Closing the Digital Divide



Mobile Shopping, Advertising, and Content Provision

- WIRELESS SHOPPING
- MOBILE AND TARGETED ADVERTISING
- mobile portal

A customer interaction channel that aggregates content and services for mobile users.



Mobile Enterprise and Supply Chain

- **SUPPORT OF MOBILE EMPLOYEES**
 - Mobile Office
 - Sales Force Mobilization and Automation
 - Worker Support in Retailing
 - Support in Operations
 - Job Dispatch
 - Maintenance and Repair at Remote Sites



Mobile Consumer Services

- MOBILE ENTERTAINMENT
 - Music and Video
 - Mobile Games
 - Mobile Gambling

Location-Based Mobile Commerce

- location-based m-commerce**

Delivery of m-commerce transactions to individuals in a specific location, at a specific time.

- Five key factors for services provided :
 1. Location
 2. Navigation
 3. Tracking
 4. Mapping
 5. Timing



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Seven waves of mobile computing

Portability

Miniaturization

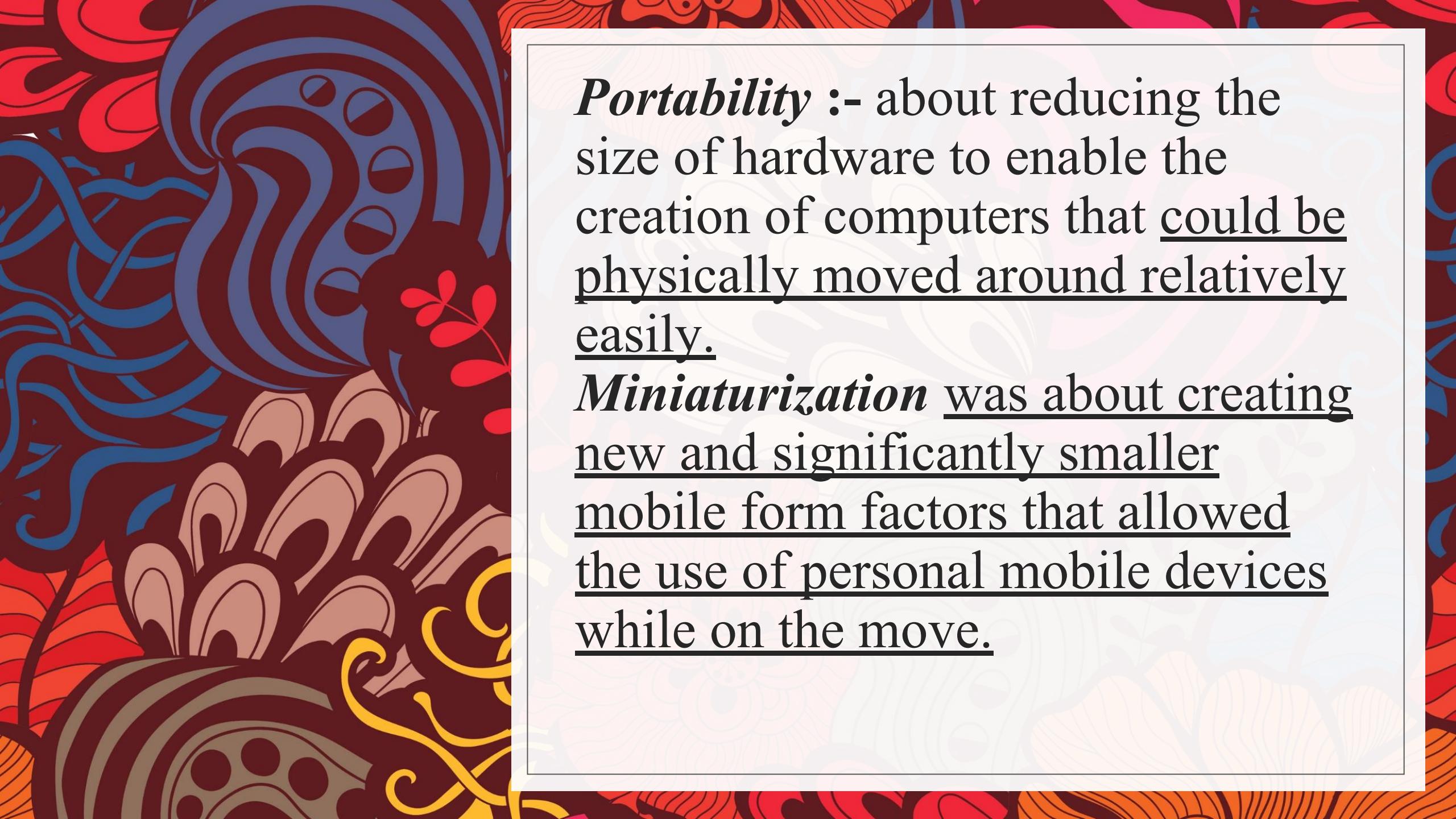
Connectivity

Convergence

Divergence

Apps

Digital
ecosystems



Portability :- about reducing the size of hardware to enable the creation of computers that could be physically moved around relatively easily.

Miniaturization was about creating new and significantly smaller mobile form factors that allowed the use of personal mobile devices while on the move.



Connectivity :-about developing devices and applications that allowed users to be online and communicate via wireless data networks while on the move.

Convergence :- about integrating emerging types of digital mobile devices, such as Personal Digital Assistants (PDAs), mobile phones, music players, cameras, games, etc., into hybrid devices.



Divergence :- It took an opposite approach to interaction design by promoting information appliances with specialized functionality rather than generalized ones.

App:- The latest wave of *apps* is about developing matter and substance for use and consumption on mobile devices, and making access to this fun or functional interactive application content easy and enjoyable.



Digital ecosystems:- about the larger wholes of pervasive and interrelated technologies that interactive mobile systems are increasingly becoming a part of.



Applications of Mobile Computing (Cont.)

- For Estate Agents
- In courts
- In companies
- Stock Information Collection/Control
- Credit Card Verification
- Taxi/Truck Dispatch
- Electronic Mail/Paging

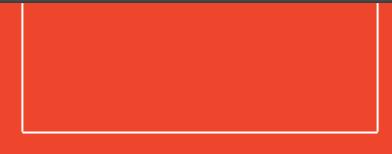
Challenges

- Disconnection
- Low bandwidth
- High bandwidth variability
- Low power and resources
- Security risks
- Wide variety terminals and devices with different capabilities
- Device attributes
- Fit more functionality into single, smaller device

Future of Mobile Computing

- Use of Artificial Intelligence
- Integrated Circuitry -> Compact Size
- Increases in Computer Processor speeds

SMART MATERIAL



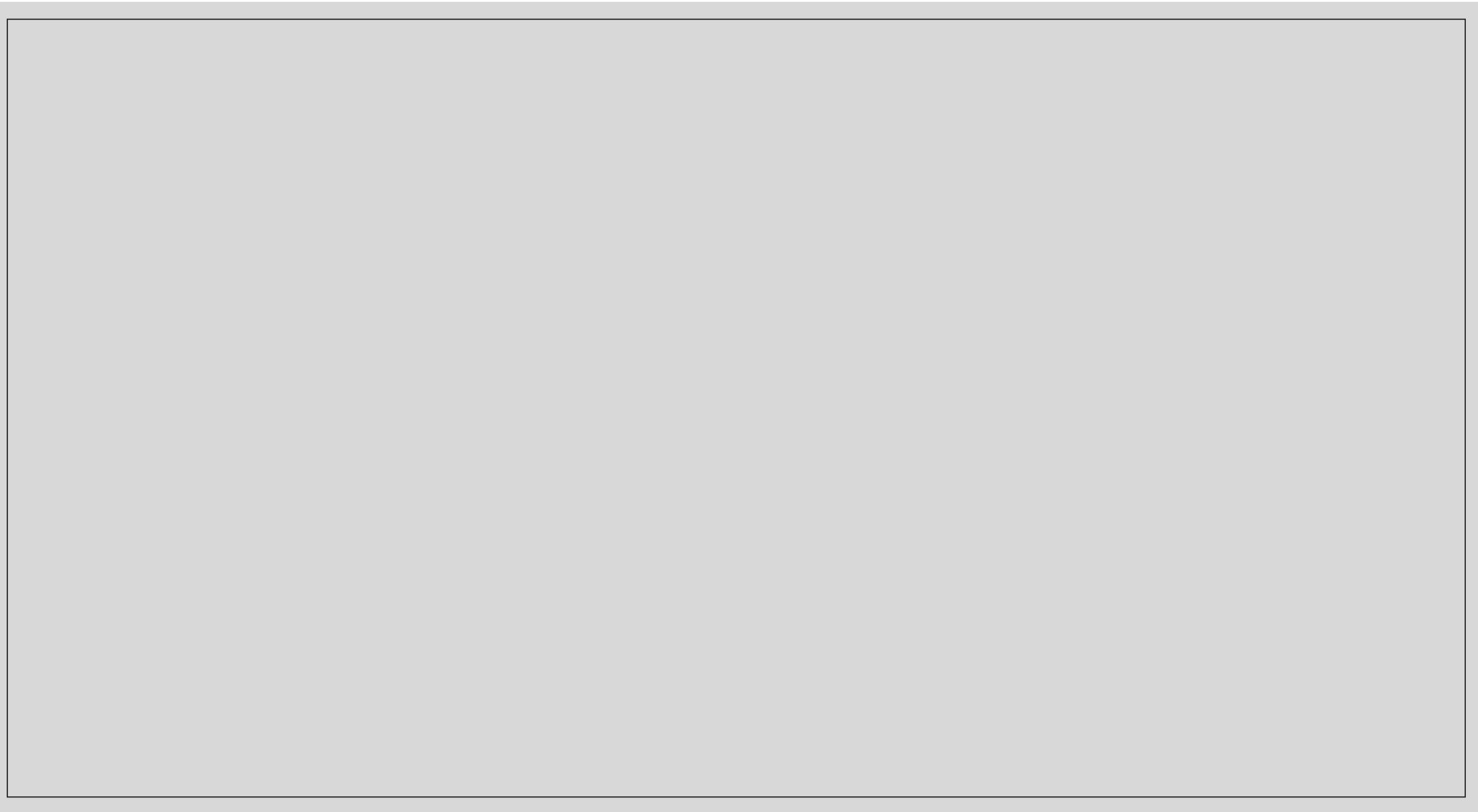
Smart materials, also called **intelligent or responsive materials**, are designed materials that have one or more properties that can be significantly changed in a controlled fashion by external stimuli, such as stress, moisture, electric or magnetic fields, light, temperature, pH, or chemical compounds.

Examples include **colour-changing novelty mugs, sensors ,colour-changing spoons, battery power indicators and forehead thermometers**.





Augmented Reality



A woman in a dark jacket and white VR headset stands in a modern office, interacting with a futuristic digital interface. The interface features a glowing blue wireframe city model with glowing nodes and connection lines. This digital city is superimposed over the real-world office environment, which includes desks, papers, and other office elements.

Augmented Reality

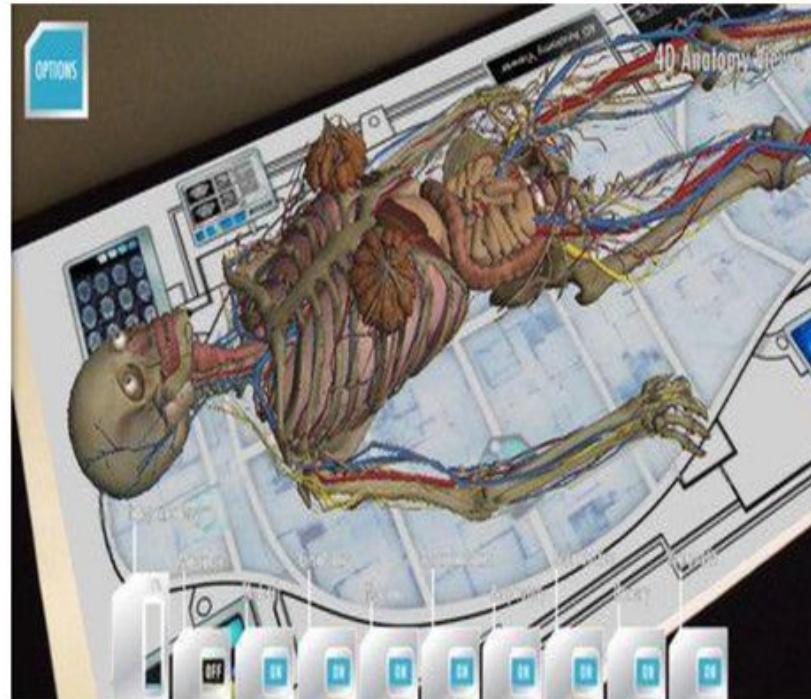
A vertical strip on the left side of the slide features a woman in a dark blazer and white shirt wearing a VR headset. She is standing in an office environment with glass walls. A digital overlay of a futuristic city skyline with glowing blue lights and network connections is visible, suggesting a theme of digital integration or augmented reality.

Augmented Reality

- Augmented reality keeps the real world central but enhances it with other digital details, layering new strata of perception, and supplementing your reality or environment

What Is Augmented Reality (AR)?

- A combination of
 - a real scene viewed by a user and
 - a virtual scene generated by a computer that augments the scene with additional information.



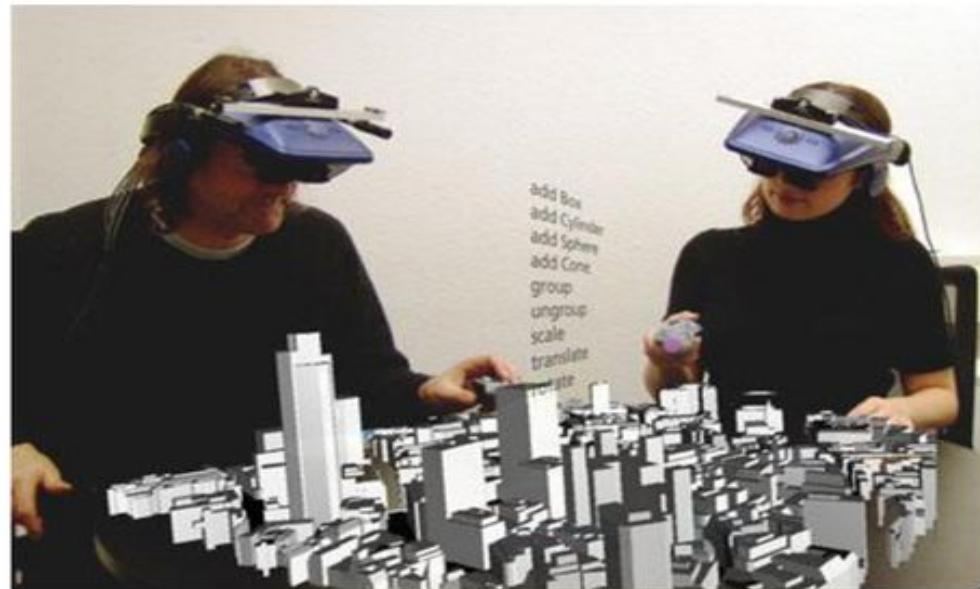
Nuts and Bolts of AR

Characteristics of AR

- It combines real and virtual
- It is interactive in real time
- It is registered in 3D

Hardware Needed

- Display
- Input devices-camera
- Processor-CPU
- Sensors-accelerometer
- Tracking-GPS, compass



What is Virtual Reality (VR)?

- Virtual reality or virtual realities (VR), also known as immersive multimedia or computer-simulated reality, is a computer technology that replicates an environment, real or imagined, and simulates a user's physical presence that environment in a way that allows the user to interact with it.

Nuts and Bolts of VR

A true VR experience should include:

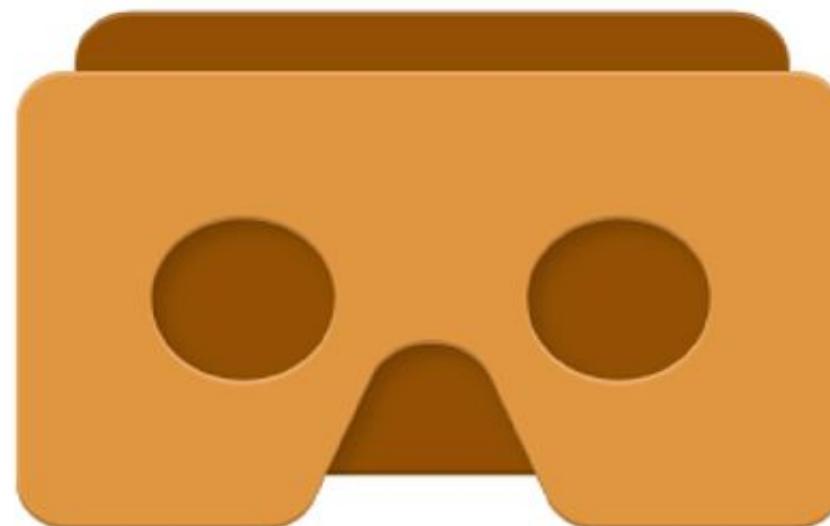
- Three-dimensional images that appear to be life-sized from the perspective of the user
- The ability to track a user's motions, particularly his head and eye movements, and correspondingly adjust the images on the user's display to reflect the change in perspective



Nuts and Bolts of VR

Hardware Needed

- A device-phone either android or iOs
- Google cardboard, or another VR headset
- Google cardboard app



Augmented Reality vs. Virtual Reality

Augmented Reality

- System augments the real world scene
- User maintains a sense of presence in real world
- Needs a mechanism to combine virtual and real worlds
- Hard to register real and virtual

Virtual Reality

- Totally immersive environment
- Senses are under control of system
- Need a mechanism to feed virtual world to user
- Hard to make VR world interesting

Mixed Reality

- Mixed Reality•Mixed Reality (MR) is a term that has been used to refer to the entire spectrum of situations that span the continuum between virtual reality and actual reality. •Blends the real and the synthetic into a single landscape & experience

The difference between augmented, virtual and mixed reality software

AUGMENTED REALITY	VIRTUAL REALITY	MIXED REALITY
<p>Interactive objects are layered on top of the physical environment without the ability to manipulate the augmented objects. AR overlays digital information onto the real world.</p> 	<p>The real world is hidden and the user is completely immersed in a digital experience, creating a digital simulation of a real environment.</p> 	<p>The capabilities of AR and VR are blended, bringing together the physical and digital world to produce an environment where physical and digital objects coexist and interact in real time.</p> 