



# Mobile Device Interfaces

## Lecture No. 2

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European Union  
European Social Fund



MINISTRY OF EDUCATION & RELIGIOUS AFFAIRS  
MANAGING AUTHORITY

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# Design Principles and Instrumentation for **Mobile Interfaces**



# Issues encountered

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- Principles of User Centered Design
- Computer development and transition to mobile device interfaces
- Consequences from the rapid deployment of mobile interfaces
- Is the pursued programming methodology effective;
- Conclusion – Future trends



# Consequences from the rapid deployment of mobile interfaces

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User centered design implies an intended methodology that focuses on specific programming elements:

## DESIGN RULES

### Designing for maximum usability – the goal of interaction design

- **Principles of usability**
  - **general understanding**
- **Standards and guidelines**
  - **direction for design**
- **Design patterns**
  - **capture and reuse design knowledge**



# Consequences from the rapid deployment of mobile interfaces

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User centered design implies an intended methodology that focuses on specific programming elements:

## TYPES of design rules

- **principles**
  - **abstract design rules**
  - **low authority**
  - **high generality**
- **standards**
  - **specific design rules**
  - **high authority**
  - **limited application**
- **guidelines**
  - **lower authority**
  - **more general application**



# Consequences from the rapid deployment of mobile interfaces

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User centered design implies an intended methodology that focuses on specific programming elements:

Principles to  
Support  
Usability

## **Learnability**

the ease with which new users can begin effective interaction and achieve maximal performance

## **Flexibility**

the multiplicity of ways the user and system exchange information

## **Robustness**

the level of support provided the user in determining successful achievement and assessment of goal-directed behaviour





# Consequences from the rapid deployment of mobile interfaces

User centered design implies an intended methodology that focuses on specific programming elements:

## PRINCIPLES TO SUPPORT LEARNABILITY

2014



Google Glasses. Source: Google photo.

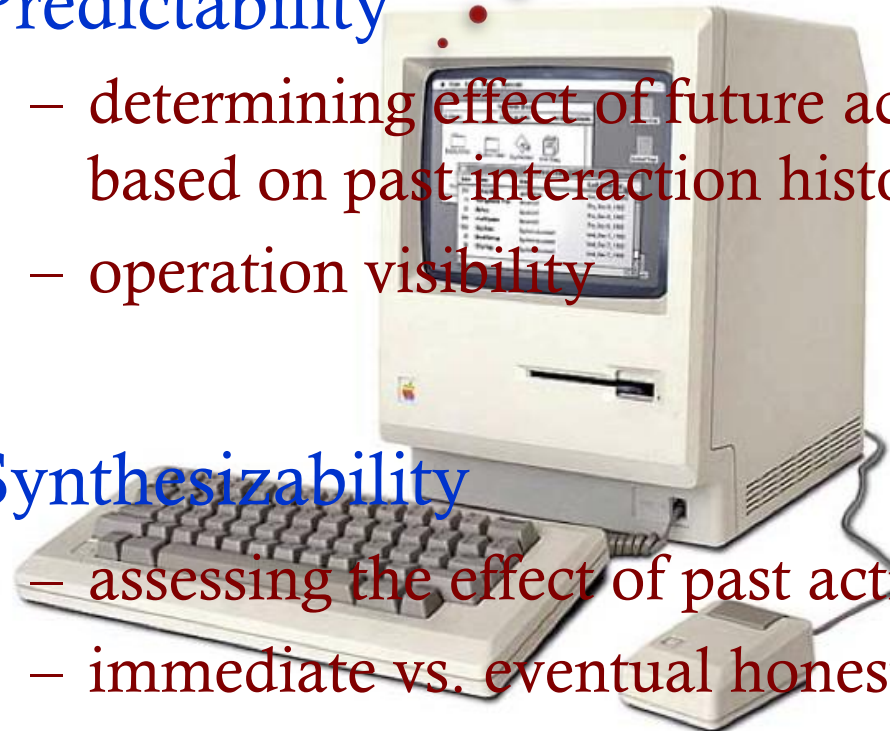
### Predictability

- determining effect of future actions based on past interaction history
- operation visibility

### Synthesizability

- assessing the effect of past actions
- immediate vs. eventual honesty

1984



Apple Macintosh, 1984. Source: www.oldcomputers.com

# Consequences from the rapid deployment of mobile interfaces

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User centered design implies an intended methodology that focuses on specific programming elements:

## PRINCIPLES TO SUPPORT LEARNABILITY NO 2

### Familiarity

- how prior knowledge applies to new system
- guessability; affordance

### Generalizability

- extending specific interaction knowledge to new situations

### Consistency

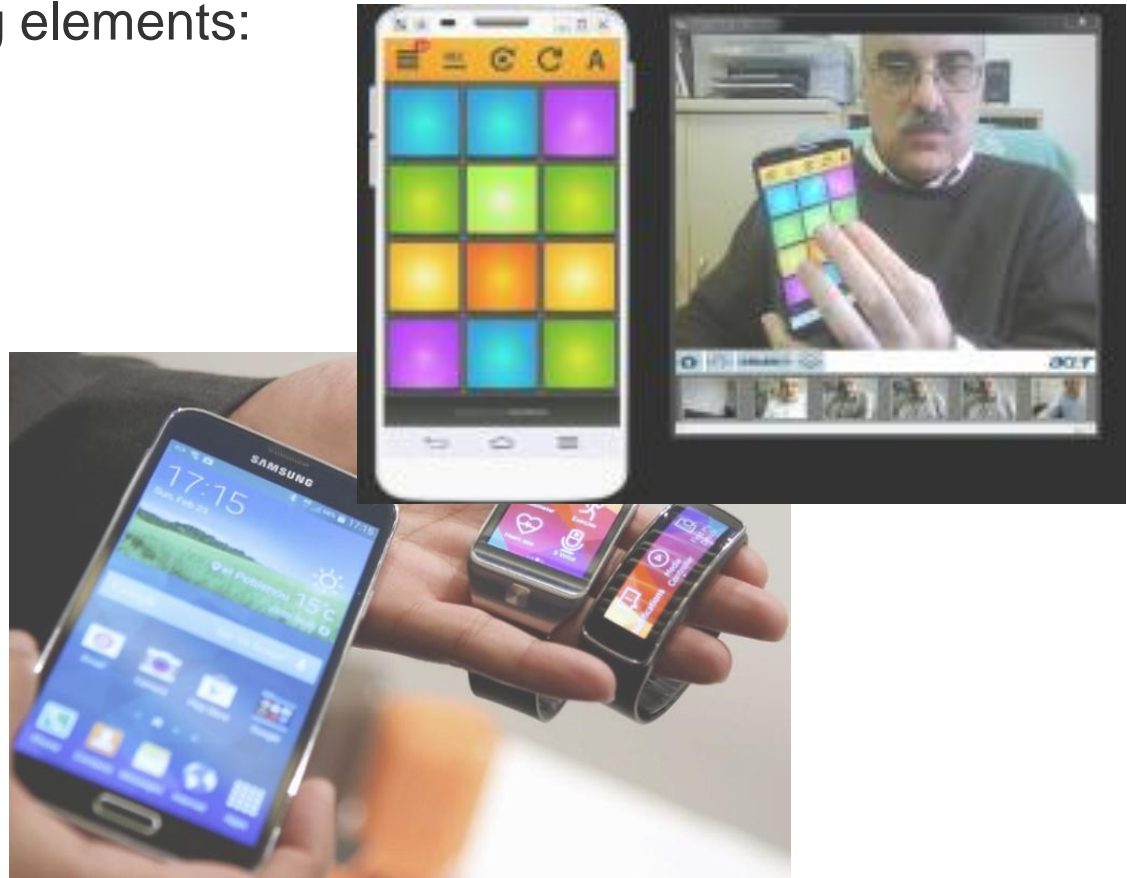
- likeness in input/output behaviour arising
- from similar situations or task objectives



# Consequences from the rapid deployment of mobile interfaces

User centered design implies an intended methodology that focuses on specific programming elements:

PRINCIPLES TO  
SUPPORT  
LEARNABILITY  
NO 3

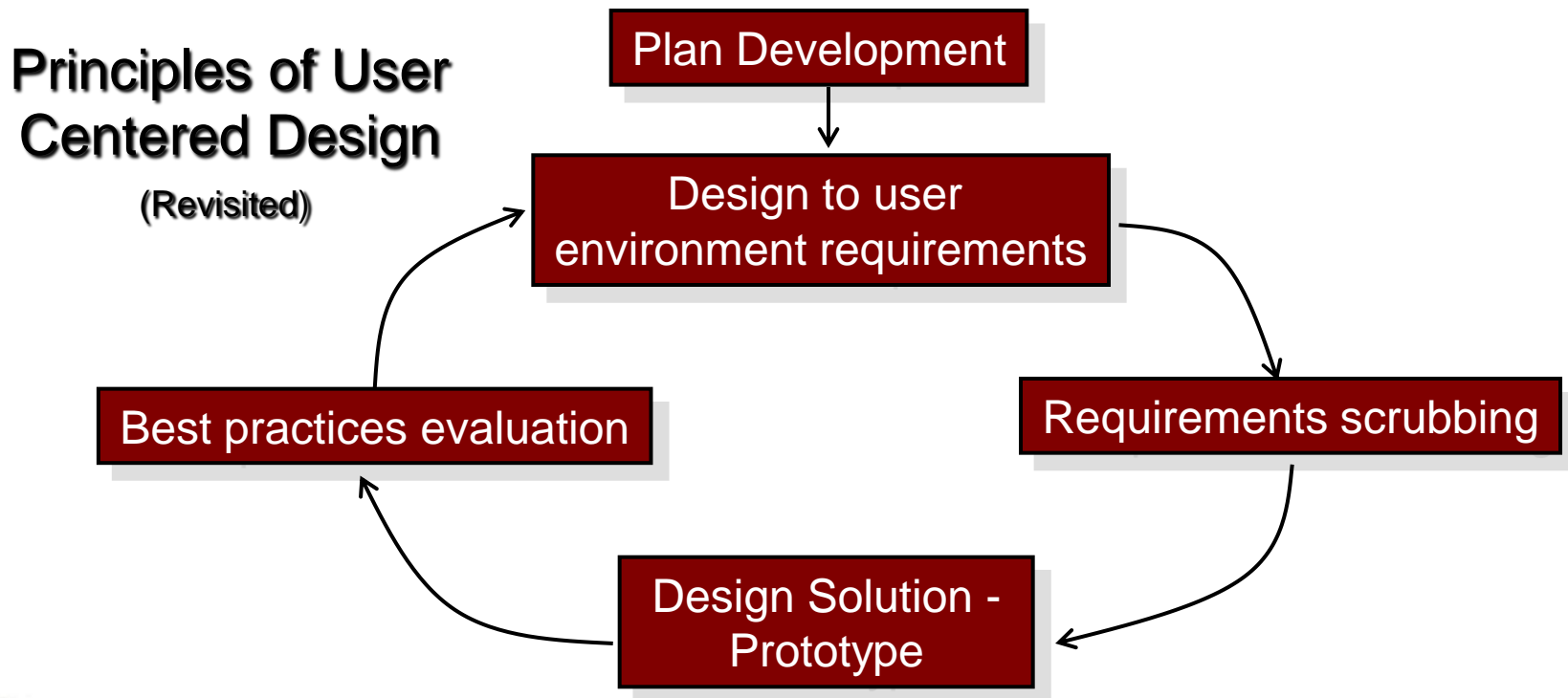


Smart devices. Source: Samsung.



# Is the pursued programming methodology effective;

## ISO 13407 development plan for process quality evolutionary prototyping

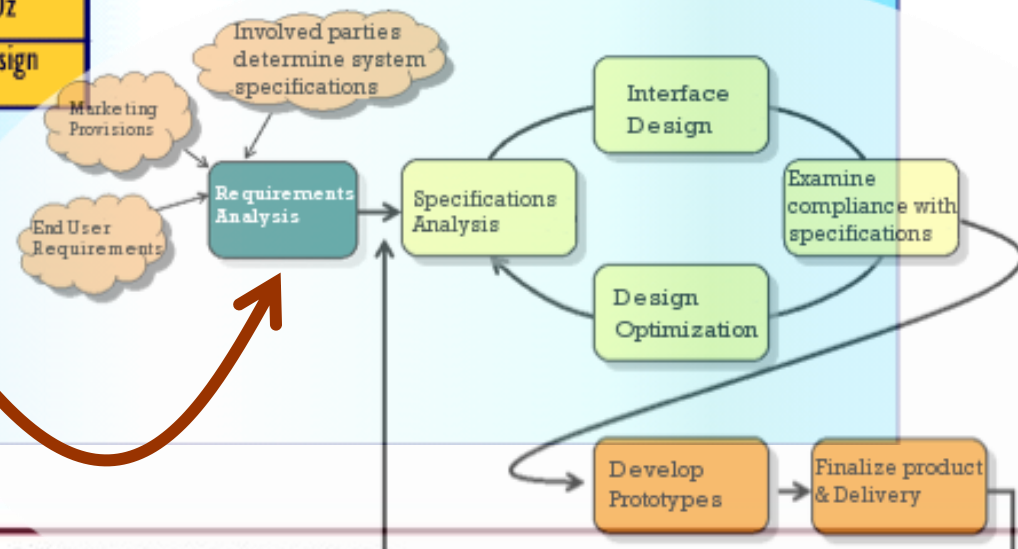


# Is the pursued programming methodology effective;

## Development Stages and Methods

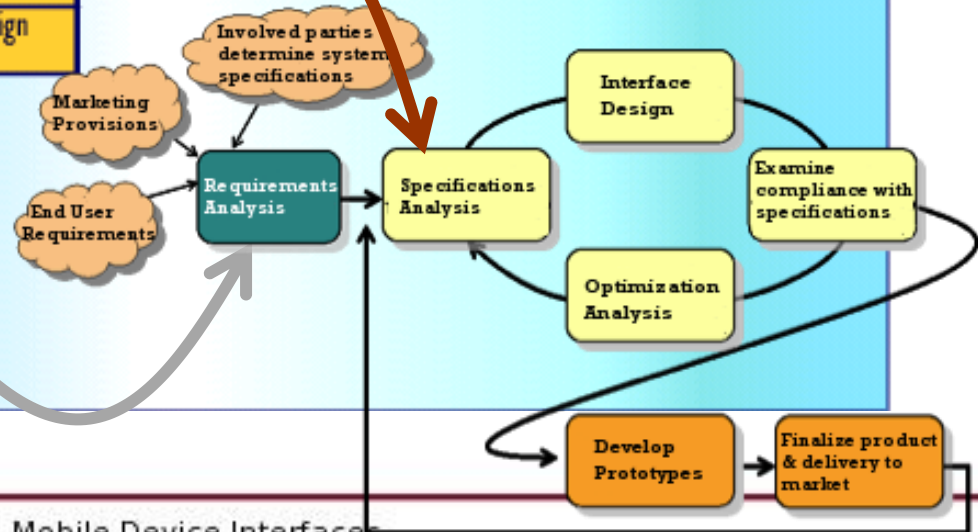
in detail

Planning & Feasibility	Requirements	Design	Implementation	Test & Measure	Post Release
Getting started	User Surveys	Design guidelines	Style guides	Diagnostic evaluation	Post release testing
Stakeholder meeting	Interviews	Paper prototyping	Rapid prototyping	Performance testing	Subjective assessment
Analyse content	Contextual inquiry	Heuristic evaluation		Subjective evaluation	User surveys
ISO 13407	User Observation	Parallel design		Heuristic evaluation	Remote evaluation
Planning	Context	Storyboarding		Critical Incidence Technique	
Competitor Analysis	Focus Groups	Evaluate prototype		Pleasure	
	Brainstorming	Wizard of Oz			
	Evaluating existing systems	Interface design patterns			
	Card Sorting				
	Affinity diagramming				
	Scenarios of use				
	Task Analysis				
	Requirements meeting				



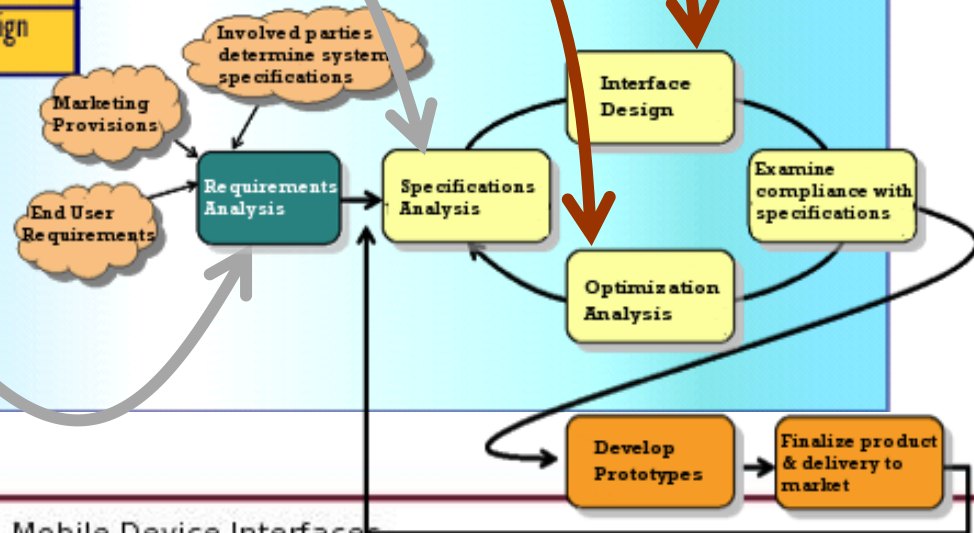
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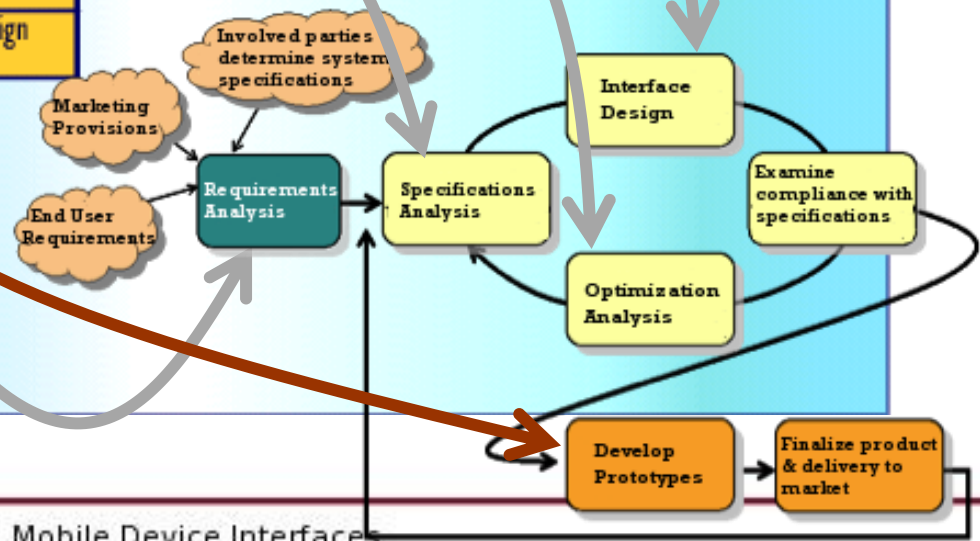
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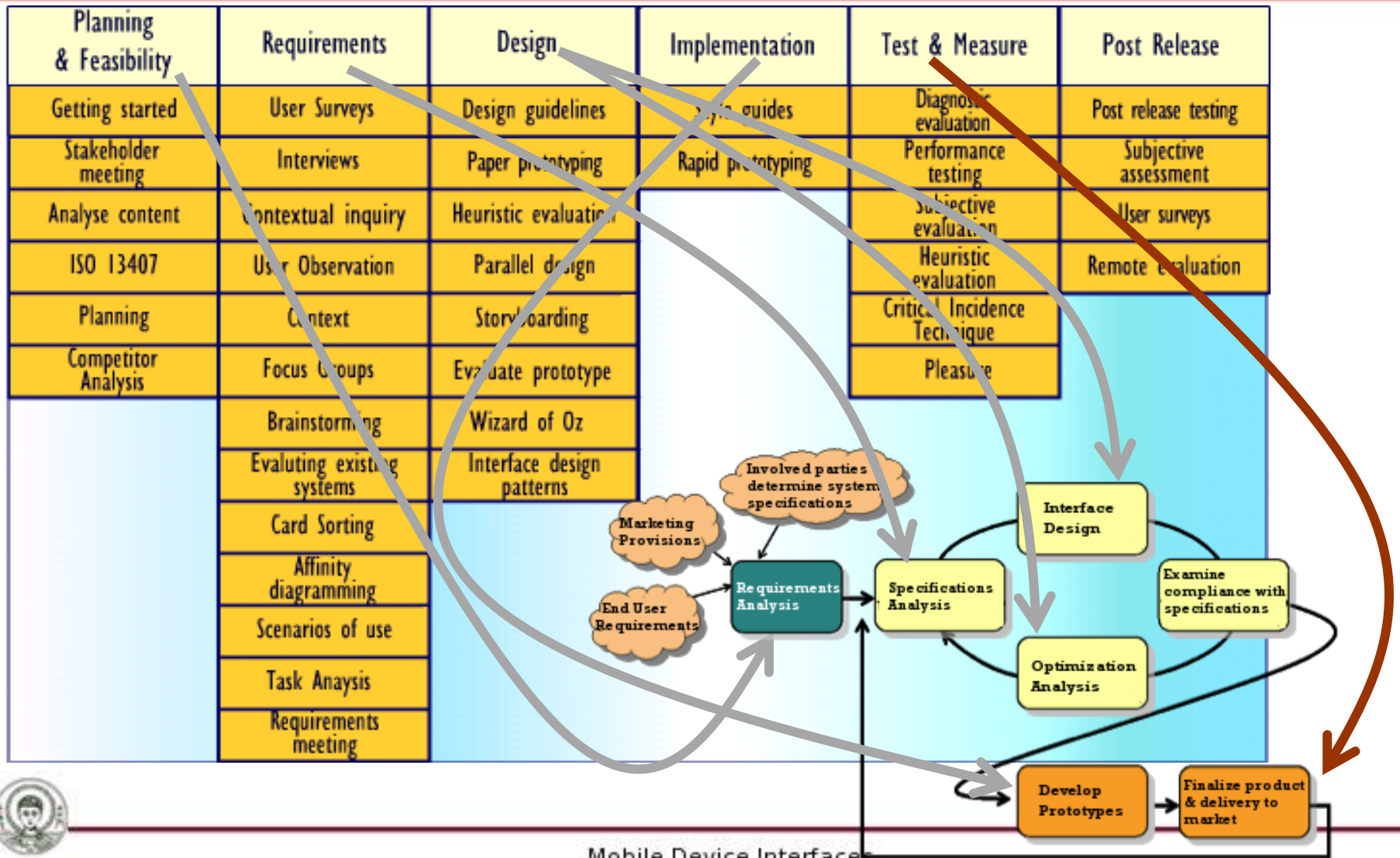
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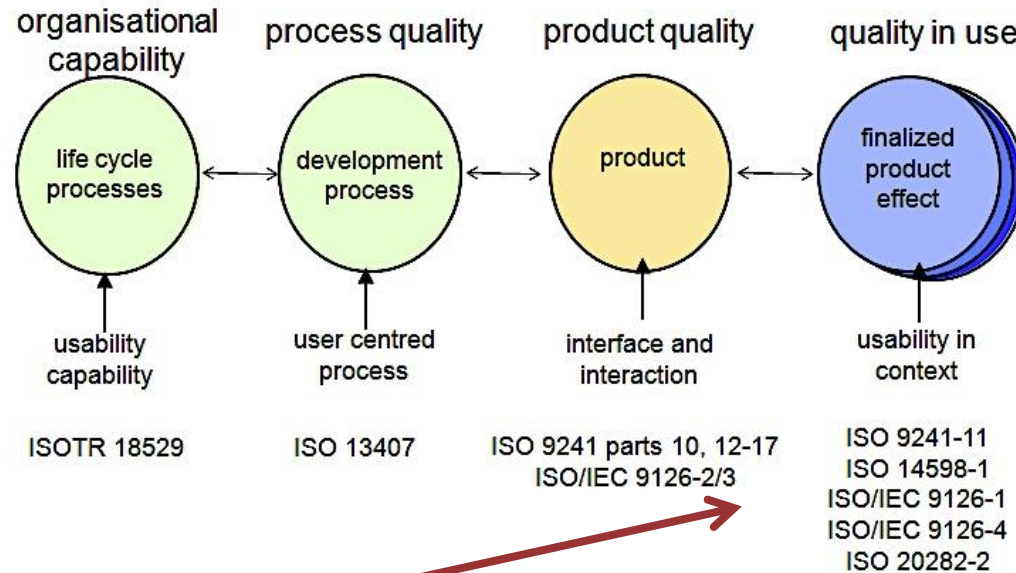




# Is the pursued programming methodology effective; Development Stages and Methods



# Is the pursued programming methodology effective;



**The basic principles of User-Centered Design applied to Mobile Device Interfaces programming...**



# Is the pursued programming methodology effective;

- User centered design implies an intended methodology that focuses on specific programming elements: **Wearable technology**



Left: The Ibis “intelligent watch”, by Creoir. Photo: AFP . Right: The Apple Mac Book.



# Is the pursued programming methodology effective;

- User centered design implies an intended methodology that focuses on specific programming elements: **Pointing technology**



Samsung' s Gear Fit. Source: Getty photo.



**Indeed, how do we point or select when a multitude of visual representations the spice of modern display technology?**

The Apple Mac Book. Source: Apple



# Is the pursued programming methodology effective;

- User centered design implies an intended methodology that focuses on specific programming elements: **Screen streaming technology**



Source: Sony. The SWR10 SmartBand fitness band.



# Is the pursued programming methodology effective;

- User centered design implies an intended methodology that focuses on specific programming elements: How, after all, commencing from this situation ... (where for the first time the topic of **interconnection** was brought up as a protagonist)

- **Screen streaming technology**

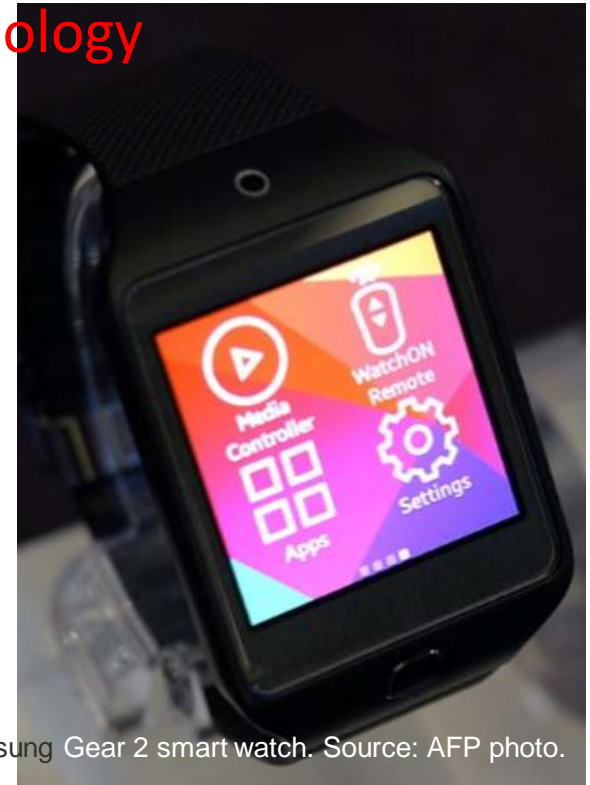


Apple: Multimedia streaming technologies.



# Is the pursued programming methodology effective;

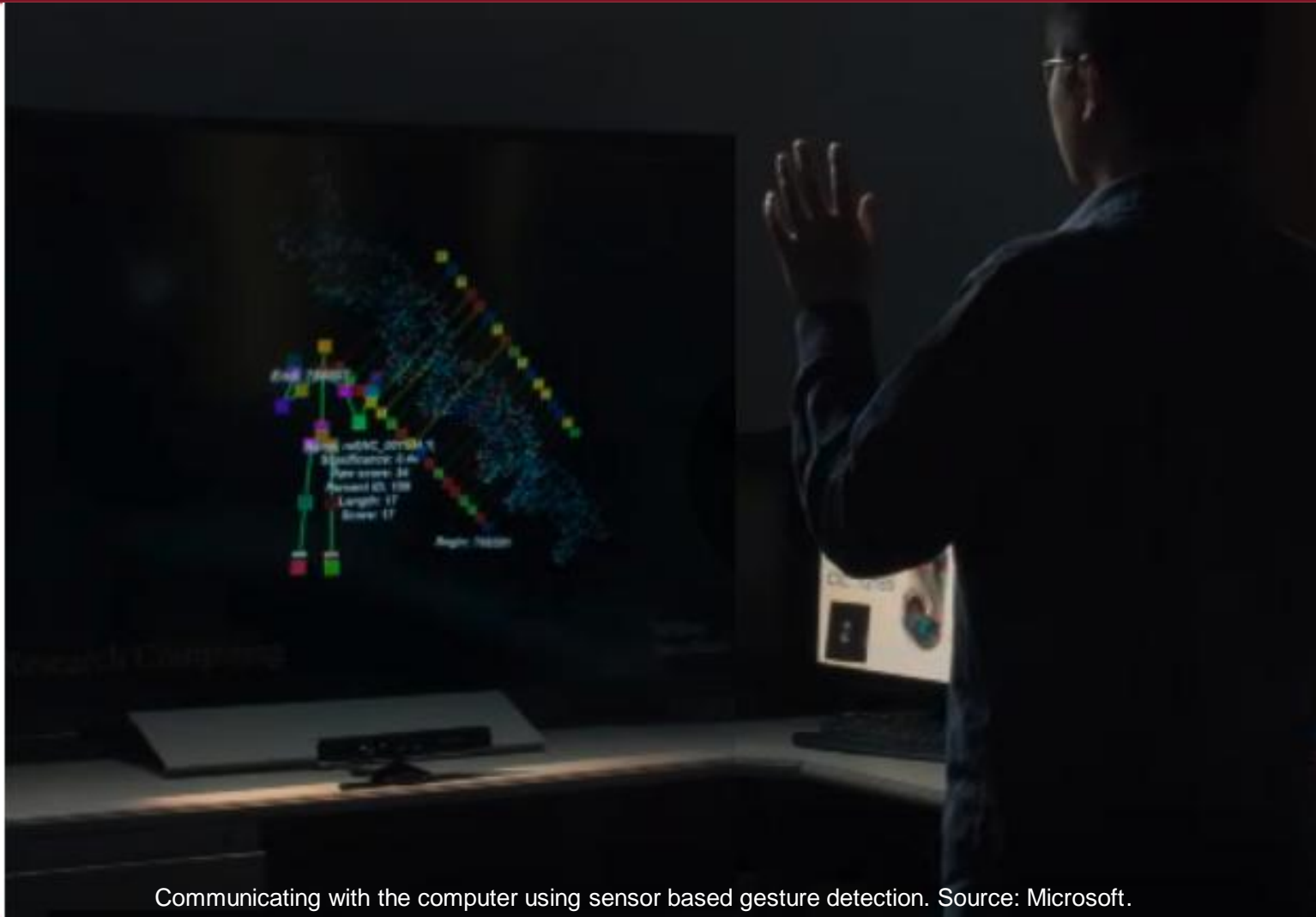
- User centered design implies an intended methodology that focuses on specific programming elements: **Sensors technology**



Left: Apple MacBook connected with motion sensors. Source: Apple. Right: The Samsung Gear 2 smart watch. Source: AFP photo.



User centered design implies an intended methodology that focuses on specific programming elements:  Sensing technology

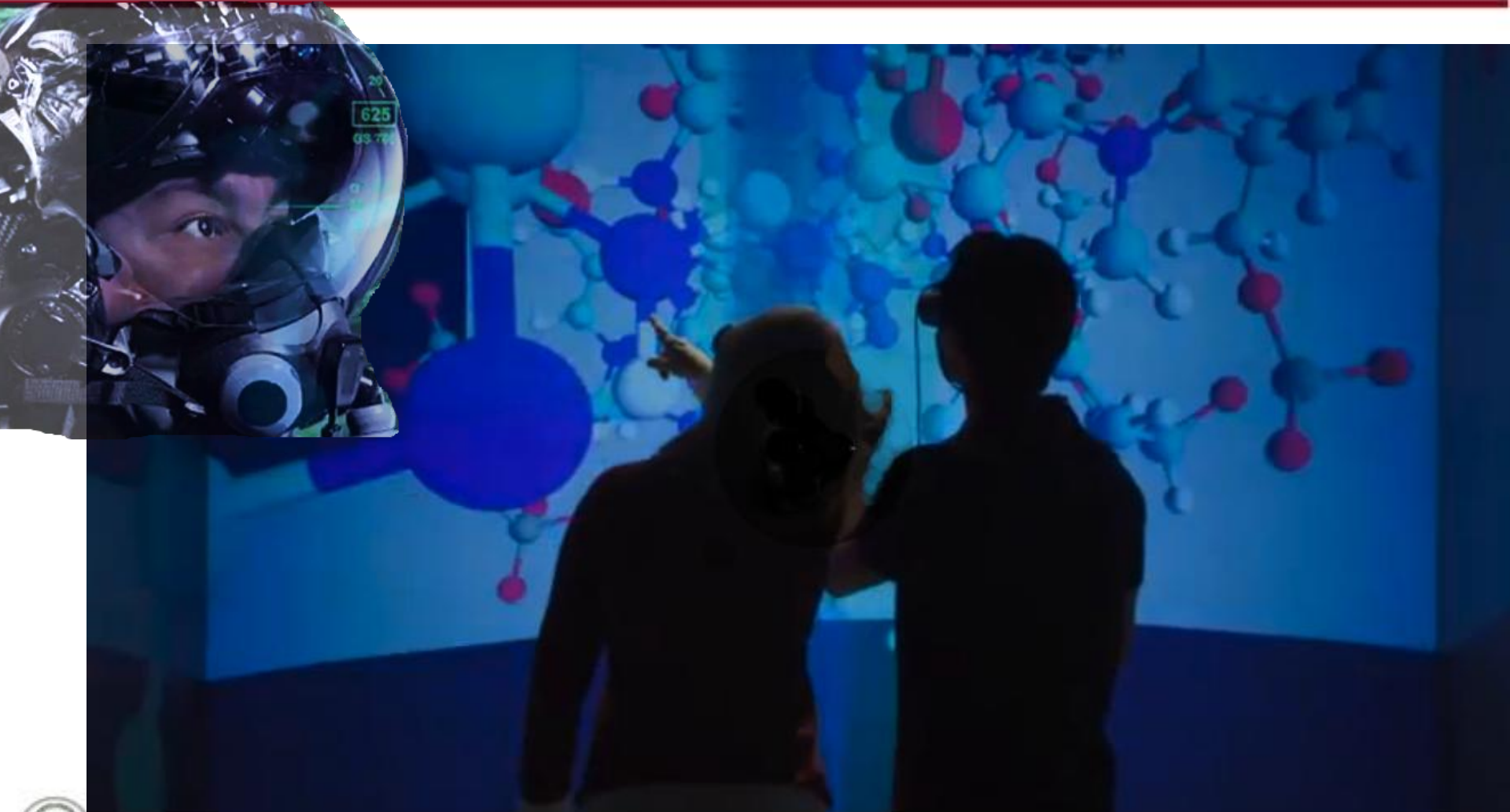


Communicating with the computer using sensor based gesture detection. Source: Microsoft.






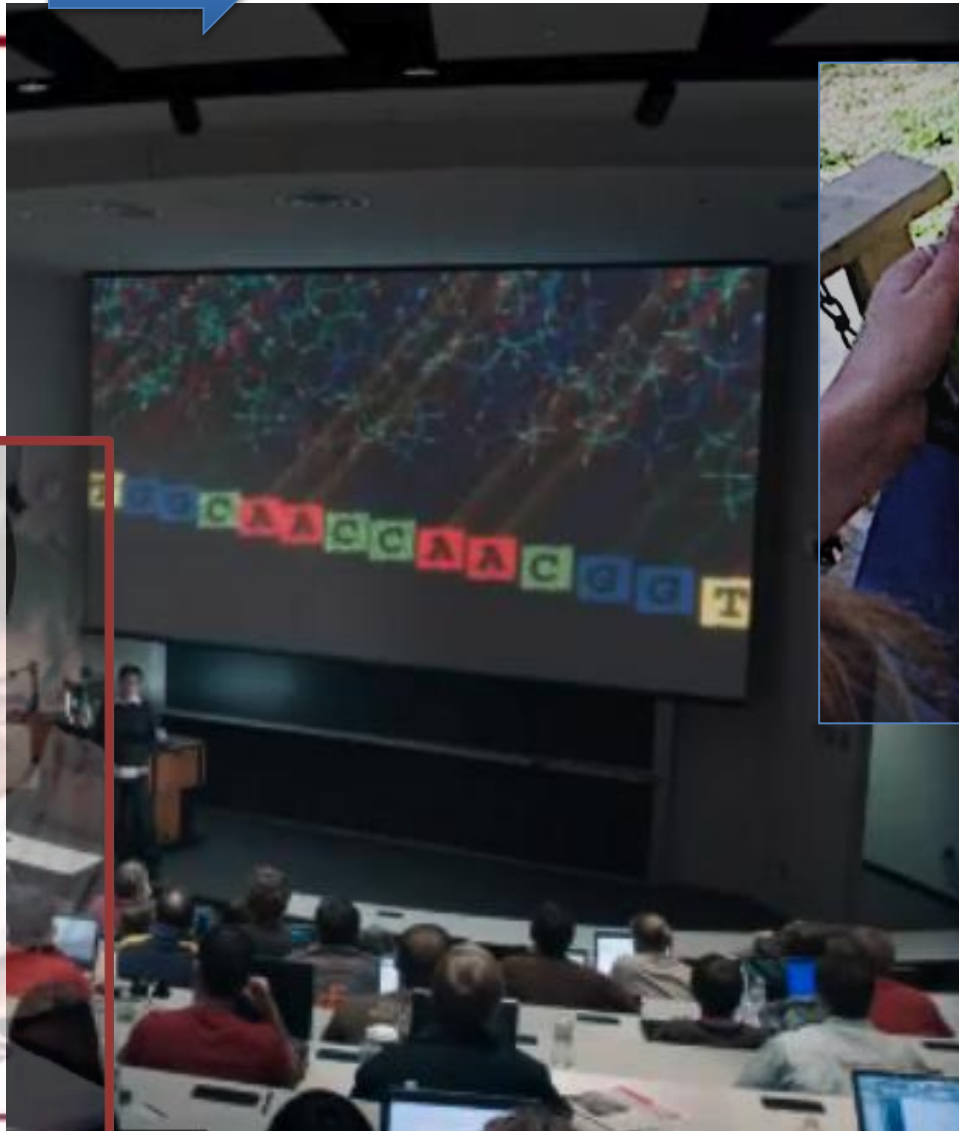
By using highly interactive technologies, can we transform the operational paradigm of teaching?  **Augmented Reality**



Sources: Rockwell-Collins, Microsoft.



Can we mingle learning technologies with free time, personal communication equipment?  **Ubiquitous Learning, Non-Formal Education**



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Source: Microsoft.

Source: Microsoft.

# Conclusion

... will we reach this level of integration?



Source: Apple.



# End of the 2<sup>nd</sup> Lecture

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## Sources :

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- J. Preece, Y. Rogers, H. Sharp, INTERACTION DESIGN – beyond Human-Computer Interaction 4<sup>th</sup> Edition, John Wiley & Sons, 2015



# Reference note

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