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Human Computer Interaction interaction design

Lecture No. 5

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Theoretical Models & Approaches

Human Centered Design

**part C: The “best” and the “more
complex”**



An example for deep thoughts ...

- You've won a lot of money in a lottery and you decide to buy a very good car.
- The salesclerk shows you two of the niche market best selling cars that have roughly the same price: an off-the-road SUV and a sports car.
- If you must choose one of the two on the grounds of the “best” and the “most complex”, which one would you choose;
- The “best” refers to the human-centric design because usually we desire what is best for us, the “users”.
- In addition, people introduce the concept of complexity as it answers the following question, beyond “likes” or “dislikes”: “How much more suitable is it for the job I want it for;”
- These two concepts in human-centered design intertwine:
 - Complexity
 - The concept of the best (for us, the users)



Human-Centered Design

- Refers to a design approach that focuses on user
 - Abilities and needs
 - Environment surrounding the system
 - Tasks that need to be accomplished using the system
 - Activities (physical & mental) involved



Human-Centered Design, Where we target?

- The human-centered design refers to development processes that tailor usable systems according to user requirements.
- The starting and ending point of the design processes focus exclusively on the user.
- Perhaps the most important step in design is to know with whom to deal with, i.e. to know as much the better the user profile: the age stage, his skills, abilities and experiences on certain issues.
- The type of user in focus will determine how the system that we want to design should interact; User profiles are set up by collecting some typical characteristics and having a situated contact with users, by conversation, by observation, etc. Once the habitual or customary context of use has been described in its nature, scope or meaning, the attributes of a future product can be readily described. In some cases, users are asked to have an active role in the product's design, aiming to provide user friendly gadgets or goods that are highly customizable to their needs.



Human centered design , what we design ;

- We design interactive products
 - This of course means software systems, including websites
 - It also includes many kinds of electronic devices and gadgets: they are in contrast with the past interactive products and involve user interaction with a smart device or a “mini” computer, nearly all the times involving a display with some kind of GUI
 - Example: a smartphone, the menu of a camera, a car navigating system
- We do not plan ONLY Interfaces
- Also we plan:
 - Interactions, i.e. a number of things that make the user capable of accomplishing his goal.
 - Not only the things we usually do with this device.
 - The given on screen menu is only part of the interaction. There is a plethora of other interactions that can be devised.
- Not only direct interactions, such as pressing a button or selecting a menu can be used.
- We design complete flows of various user interactions with the device.



Source: Reuters-Samsung



Value of mobile devices (1/2)

- The transition from desktop computers to mobile devices led to a paradigm drift which has created the substrate for the awaited change of metaphor.
- A first answer to the query “what is the value of a typical smartphone”, is not of course its retail price, i.e. ~ 300 €. Due to their sophisticated characteristics that get better and better every day, we can say that their actual value ranges from 3.000-7.000 €.
- This is due to the complexity of these devices and their interconnection characteristics.
- The question, then, “is more the better” has brought the complexity issue as the forward edge of Interaction.



Source: MIT-Technology Review 2015



Value of mobile devices (2/2)

- These devices:
 - They pool inter-functionalities
 - Provide amenities
 - They can stream services provided by a variety of devices into a single device
 - They are computer substitutes
 - They provide tremendous interactivity
 - They are ... phones (amongst other functionalities)
 - Some devices readily accept 2 SIMs and thus become a mini call center
 - They open the way for next-generation interactivity
 - They are excellent video cameras and still photo cameras
 - Etc. ...
- All these and many more endorse the value of these devices within the 3.000-7.000 € range.



Source: EasyCast 2.4 G WiFi display streaming



Programming Languages – in General

- The term “language” has broad uses
- It is mainly used to refer to natural human languages
- But it also references artificial and non-human sign systems, like
 - Formal Languages in Mathematics
 - Formal Languages in Computing
 - Programming Languages
 - Media languages
 - Communication systems of any sort (animals included)
 - The Body Language
 - many, many others ...

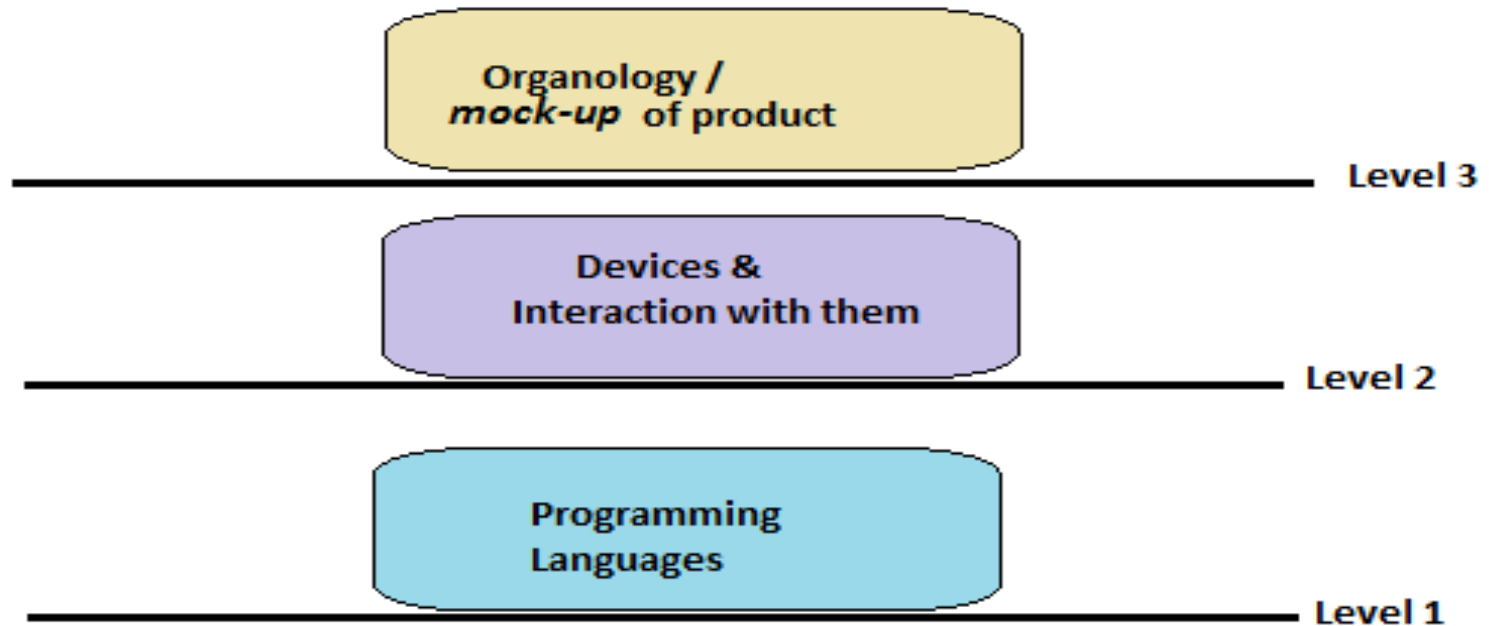


Programming Languages and Interaction Design (1/2)

- The notion of super-structured, multi-structured languages has started to appear
- The new environments are created by first modeling and initially planning their Interaction and then commencing to use a specific programming language
- The element of complexity within their use makes evident the fact that beyond Programming Languages exist Interaction Languages
- We attempt to model the Language of Interaction (by biasing the design of the device)



Programming Languages and Interaction Design (2/2)



Flash ...

- Flash is (or rather was) a SW technology that at its peak monopolized the Multimedia Interactive Design within the Internet at about 90%.
- The development of Flash Players for mobile / tablet devices is no longer supported by major OS's.
- On mobile devices (smartphones / tablets) Adobe focuses on product development via Adobe AIR, while many vendors and programmers are shifting to HTML5.
- With the newest versions of HTML5, inherent support is provided for multimedia applications. Nevertheless, not all needs of the designers are met or fulfilled.
- However, since HTML5 is promoted as an open, on mobile devices it has become an unrivaled technology, repealing Flash technology from the smartphone market.

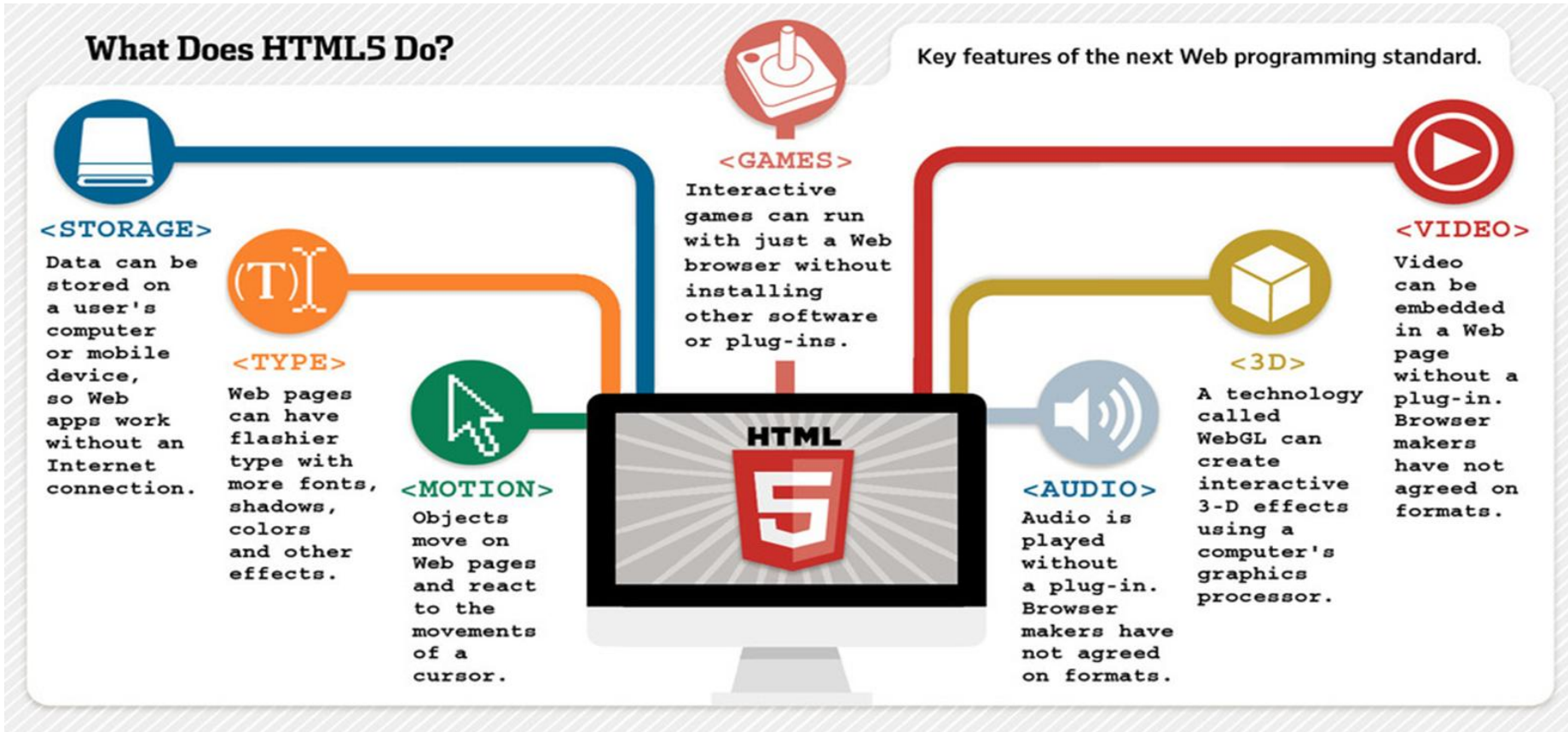


HTML 5

- HTML5 is an under development markup language for the Web, which when will be fully accomplished will be indeed a landmark version of HTML (Hypertext Language , HyperText Markup Language).
- The aim is to reduce the need for proprietary plug-in and rich Internet applications (RIA) such as Adobe Flash, the Microsoft Silverlight, the Apache Pivot, and Sun's JavaFX.
- The standard is still under development and is expected to remain so for many years, although parts of HTML5 will be delivered and will be supported by browsers before the whole model reaches a finalized Recommendation status.



What does HTML5 can do



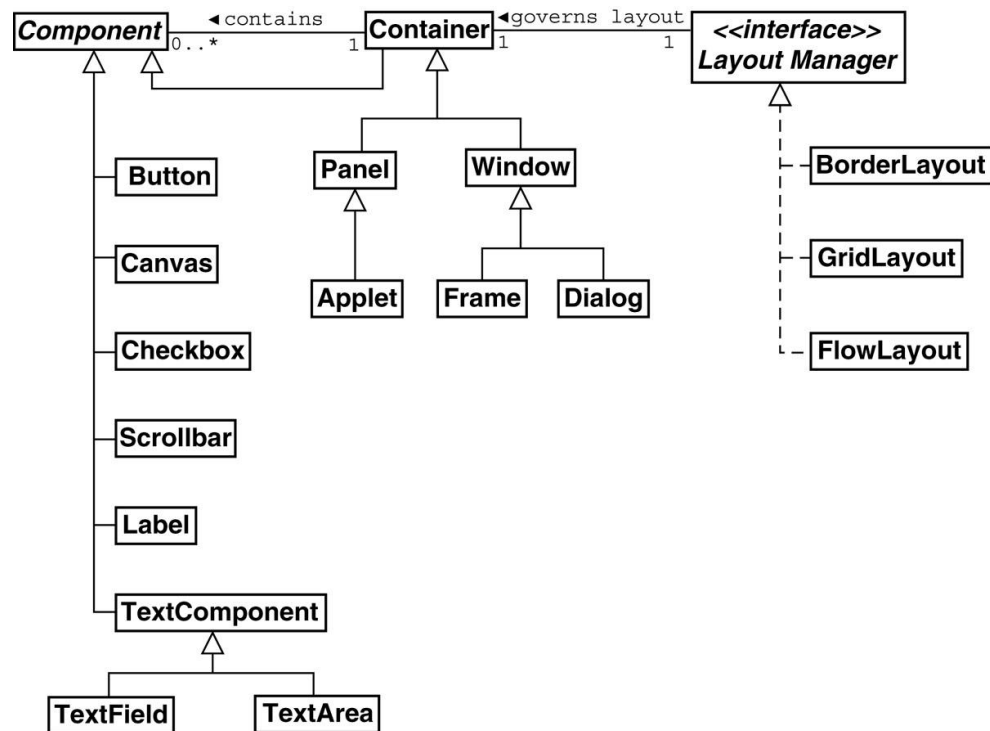
Source: Web3C - HTML5



Layout managers

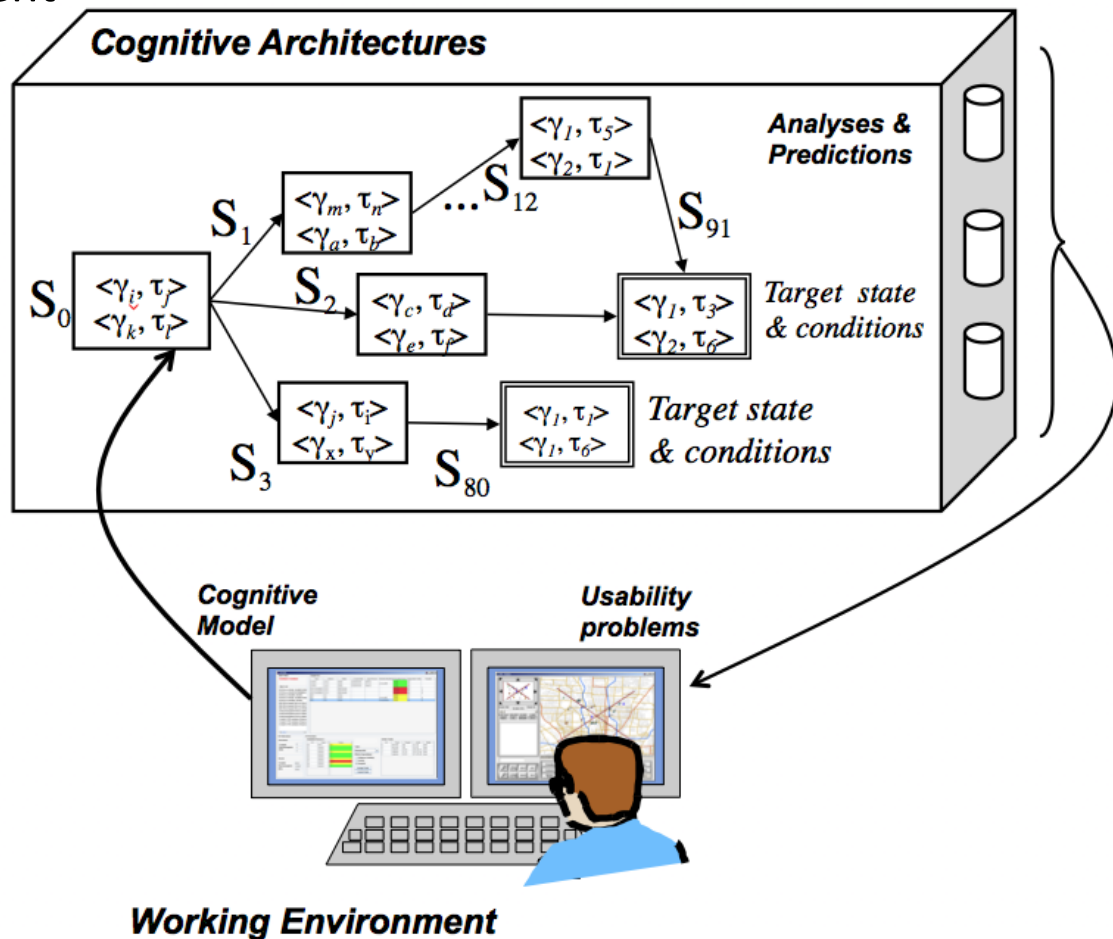
Hierarchical GUI component design with

- Flow layout
- Grid layout
- Border layout



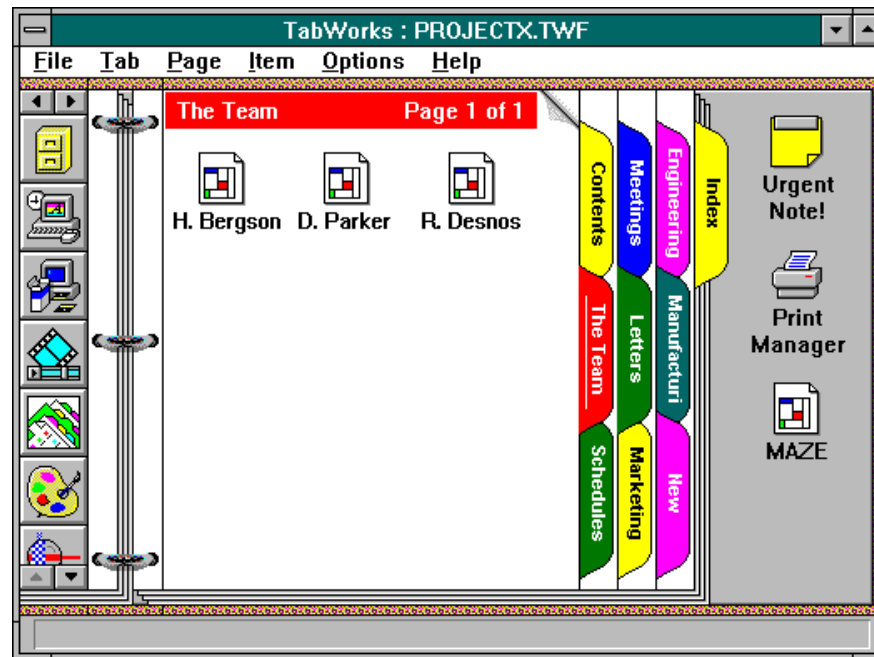
Cognitive Architectures

- The Interaction Design aims to bring into action Cognitive Architectures that provide an efficient and yet usable working environment.



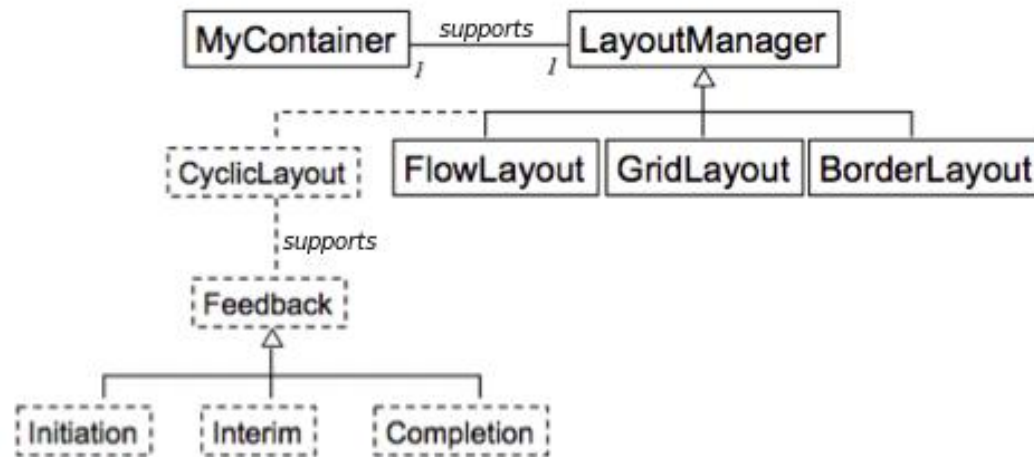
Interaction Patterns

- Container type objects that are abundantly used within an Interface, especially within the mobile world:



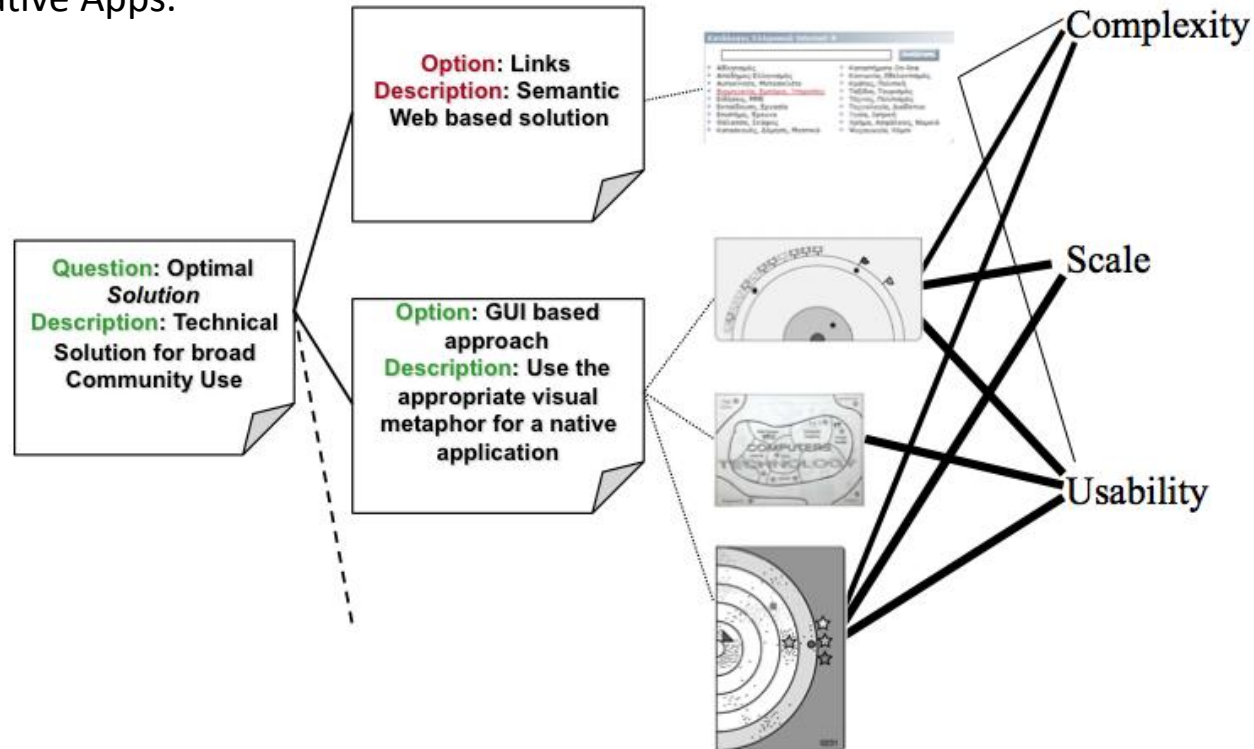
Interaction Patterns and GUI Hierarchy

- Using container class hierarchical programming we can
 - Have a “cyclic” reuse of GUI objects
 - Determine the Initial / Interim / Completed Interaction Feedback



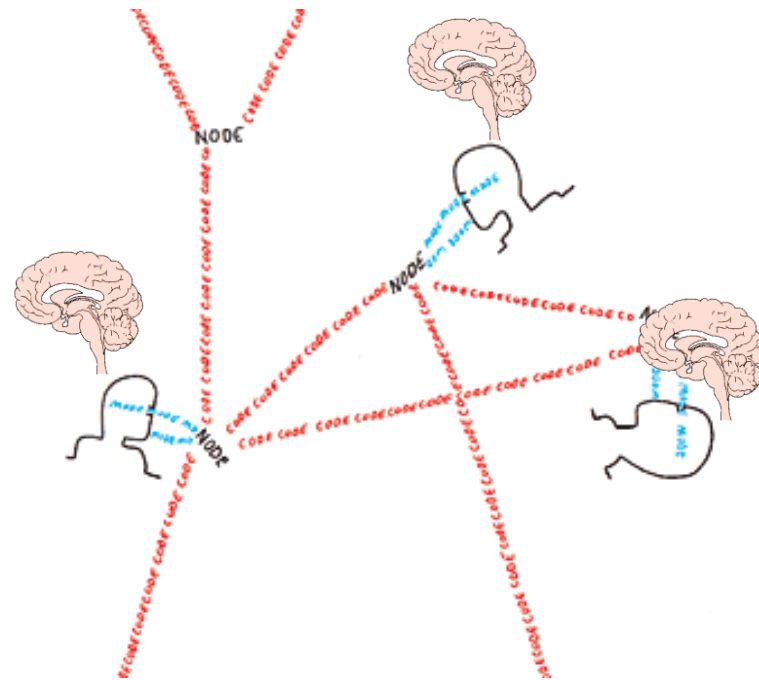
Distributed Cognitive Systems

- GUI solutions can be either Web-based or Native Apps.



Distributed Cognitive Systems

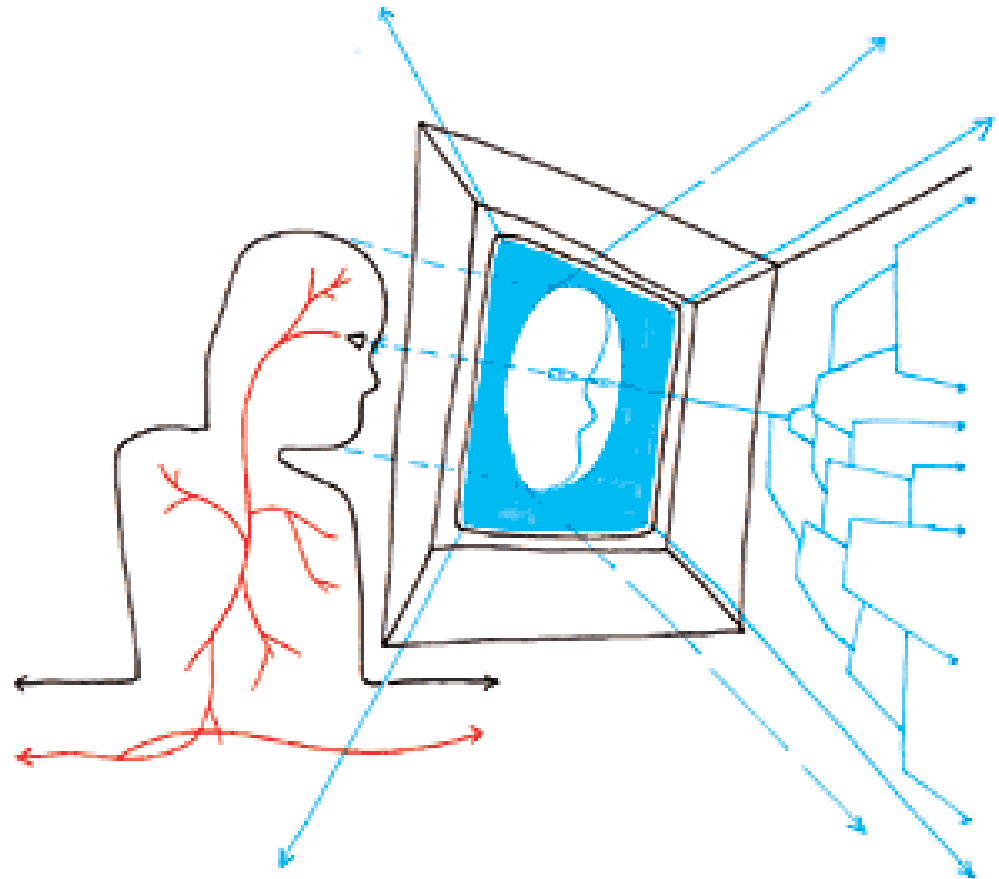
- The “cloud” and the Semantic Web 3.x provide a complex network of many types of nodes allowing users to take part in multirole operations.



Computer-based Cognitive Models

As a result, Interaction with the Web takes place within

- The Natural 3D Space
- The mental and perceptive space, i.e. the Cognitive Space
- The Cyberspace



Conclusions

- The “better” is correlated with the “more complex” and the levels of Interaction Design are extending to every possible direction to provide workable final solutions.
- The programming is both Web based and standalone, promoting interaction with native apps.
- For the first time in quite a few years we have a plethora of viable Operating Systems
- Hence, Human-centric Design evolves around three axes:
 - Programming languages
 - Interaction languages
 - Instrumentation



End of the 5th Lecture

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Reference note

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