

Personalised and adaptive interactions.

A behavioral point of view

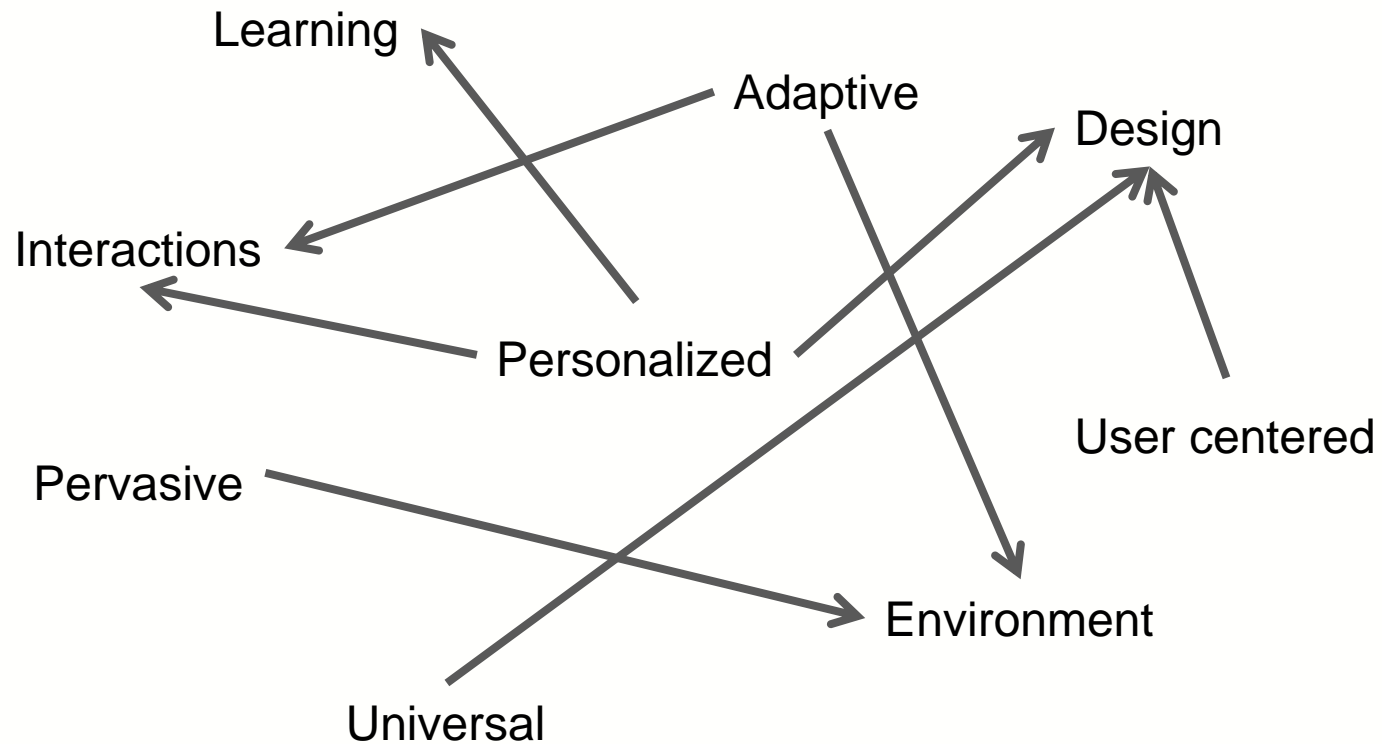
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From Universal to Personalized Design

1. Terminology



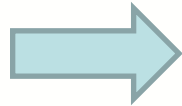
2. Conceptual issues

Philosophy

Methodology

Strategy

Universal
Design



User Centred
Design



Personalized
Interaction



3. Personalized Learning

- Evolution from User Centered Design to Personalized design
- Focus in the benefits of technology.
- Comes from a strategy related to the shift in the education model.
- Big platforms -> Specific users features

4. Personalized Learning Background

Factors that drove the learning shift:

- Diversity in the target population
- Diversity in the access media and modalities
- New conceptions of intelligence and learning

5. Personalized learning aims

Personalized learning is teaching and learning that is focused on the background, needs, potential and perception of the learner. It is learner-centred education (UNESCO, 2008)

- (a) engage students in experiential and situated learning without place, time and device restrictions
- (b) enable students to continue learning activities, initiated inside the traditional classroom, outside the classroom through their constant and contextual interaction and communication with their classmates and/or their tutors
- (c) support on-demand access to educational resources regardless of students' commitments
- (d) allow for new skills or knowledge to be immediately applied
- (e) extend traditional teacher-led classroom scenario with informal learning activities performed outside the classroom.

([Jeng et al., 2010](#)).

6. Personalized interaction

Personalized learning -> Personalized interaction

- What Is Personalized interaction
- A kind of human-machine interaction that takes into account the behavioral response of the person, his personal history, his environment and the previous history of interaction and adapts to it to respond specifically to it.

amazon.es



*Related to products
that you looked at*



*The most outstanding
products for you*

Approaches to Personalized Marketing at Their Company According to Senior Marketers in the US and Western Europe*, Jan 2016

% of respondents

Use data extracted from loyalty and customer value programs to create relevant personalized offers

69%

Use behavior-based data to develop the right content based on insights and emotions

67%

Use customer data to create individualized content and offers on a channel-specific basis

64%

Integrate customer data to create individualized content and offers that span across channels

61%

Use customer data to create targeted content and offers by demographics

52%

Use demographic categories to create at least some level of personalization for unidentified prospected customers

37%

*Note: n=100; *France, Germany, Italy and UK*

Source: Forrester Consulting, "Inspire Customers with Emotionally Engaging Content: Contextual Relevance Sparks an Emotional Connection" commissioned by Persado, July 12, 2016

7. To design a personalized-interactive application

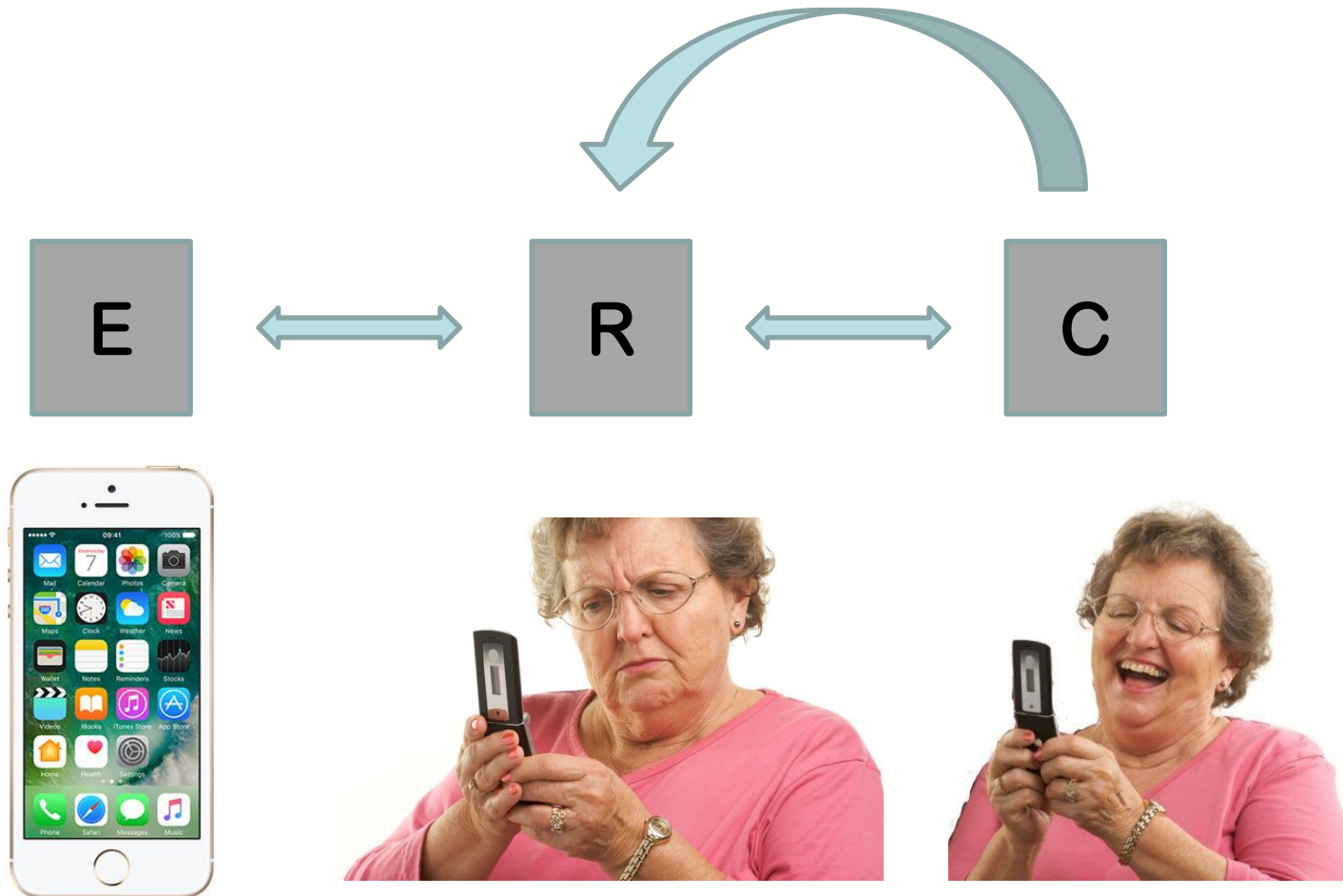
System should take into account

- **Access to information and interaction:** Font legibility, Bright, Contrast, Memory span, Information chunks organization, text orientation, etc.
- **Instrumental responses:** The main action of the user while interacting.
- **Users description:** Sociodemographic data
- **Users' history :** Interests and needs.
- **Interaction history:** Previously used information
- **Learning environment::** Where is the user located and what kind of interaction arises.
- **Social interaction:** What is the social environment of the user and how it respond to

Main point: System Adaptation

7.1. To design a personalized-interactive application

From Behavioral Psychology



7.2. To design a personalized-interactive application

From Behavioral Psychology



- **Access to information and interaction:** Font legibility, Bright, Contrast, Memory span, Information chunks organization, text orientation, etc.
- **Instrumental responses:** The main action of the user while interacting.
- **Tailored stimuli:** Reinforcement! Based on users description, history, interaction history and social reward.
- **Tailored stimuli:** Users description, history, interaction history, learning environment, social interaction

User centred design

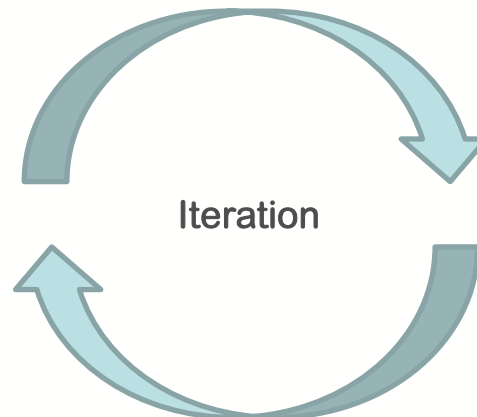
7.3. To design a personalized-interactive application

- User Centred Design

PHASES (Teoh, C)

ISO 13407 points 4 essential activities in UCD:

- **Gather the requirements:** Learn the use contexts and user's needs
- **Specify the requirements:** Specify and prioritize.
- **Design:** Produce prototypes
- **Evaluation:** Assess interaction



7.3. To design a personalized-interactive application

General issues.

ACCESSIBILITY.

Cognition

- General slowness should be taking into account and no fast actions should be required, including the double-click action.
- Neither dual tasks nor contradictory tasks
- Simplicity of the buttons and icons should be prioritized to excessive embellishment
- Button labels, icons, text and graphics should be understandable enough without required a lot of extra explanations.
- Respect limits of the human working memory and the echoic store (approx. 3 to 4 elements) when designing menus.
- Minimize the cost of response minimizing the number of actions.
- Make possible repetition.
- Visual and auditory feedback to confirm item selections should be provided.
- Provide both visual and auditory instructions

7.3. To design a personalized-interactive application

General issues

ACCESSIBILITY.

Visual Perception

- Contrast:
 - Take into account delay on adapting their vision from a dark to a light environment.
 - Contrast should be adjustable/adaptable by the user.
 - It is recommendable to put dark characters on a light background.
- Brightness
 - Different tolerance to brightness.
 - The screen should be free of glare and reflections.
- Color
 - Light colors reflect more amount of light than dark colors. Dark colors provoke more visual fatigue.
- Bold or semi-bold letters are preferred over normal ones.
- Distance between the icons
 - The system should provide the zoom option
 - Text lines should be separated enough.

7.3. To design a personalized-interactive application

General issues

ACCESSIBILITY.

Hearing

- A user can listen to 150 -160 words per minute comfortably.
- Avoid the use of homonyms (words which sound similar).
- The language used should be simple
- Provide a volume control so that users can adjust the loudness
- Abrupt changes of volume should be avoided.
- Use a different sound than a real sound (e.g. telephone), to avoid confusion.
- Take advantage of the associations between a concrete sound and a situation (e.g. emergency situation and the ambulance sound) learnt throughout life.
- Users generally prefer natural recorded speech to synthetic speech
- Messages should be presented in a serial mode, not at the same time.

7.3. To design a personalized-interactive application

From User Centered Design.

ACCESSIBILITY.

- **Mobility:** Take into account functional diversity
- **AsTeRICS** Assistive Technology Rapid Integration & Construction Set project



Partially funded by the European Commission under the Seventh Framework Programme for Research and Technological Development (FP7 - 2007-2013). G.A.No. 247730

7.3. To design a personalized-interactive application

From User Centered Design.

USABILITY.

- **Instrumental functionality aim**
 - Provide only the required
 - Increase the actions range
 - Increase the action potential
 - Minimize the delay
- **Competing behaviours**
 - Cost of response
 - Reinforcement / Punishment

7.3. To design a personalized-interactive application

ACCEPTABILITY

- Based in Aesthetics
- Based in usefulness
 - Efficient
 - Reliable
 - Pragmatic
 - Stimulating
 - Friendly
 - Intuitive
 - Easy to learn
 - Tailored to the user
 - Customizable
 - Adaptable

7.3. To design a personalized-interactive application

Foster the adaptation.

- Generate creative rules.
- Monitorize and provide specific stimuli to the person in a crescent way
- Infer new requirements based on activities performed
- Take care of the ethical issues

Conclusions

- Change the adaptation focus from the user to the system.
- The system should be ACCESSIBLE
 - Should be intuitive.
 - Be easily usable, without being tiring and causing no pain,
- The system should be USABLE with an instrumental aim.
 - Do stuff
 - Do RELEVANT stuff
 - Do COMPETITIVE Stuff
- The system should be ACCEPTABLE
 - Attractive
 - Interesting
 - “Addictive”
 - Do not cause shame.

...and in doubt, take it to the Skinner Box

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Figures and tables

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