CEIHM 2017-2017

Préparation des sujet, créations des personnas, scenarios et modèlisations de rôles
scéance 3

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Agenda

- Review of groups including
  - Application domain, target users, type (reporting OR visualization)
- Today's work
  - Describe users groups using the following methods
    - User profiling
    - User roles
    - Personas
  - Describe the main user tasks and scenarios
- Preparing next steps
  - Find users that fit in the user group description (your duty)
  - Choose a prototyping

What does it mean user group ?

- The first requirement of practical HCI design is to identify who the users will be!

- Process for identifying and selecting users
  - define the characteristics of the user population, i.e. user groups
  - work with a representative sample of the user group

- Users groups describe the characteristics of target users of an interactive system

- User groups descriptions might include
  - Users characteristics (user profiling)
  - Users tasks and responsibilities (user roles)
  - Sample in the population (number of individuals concerned)

Describing and assessing user groups

- Methods for describing user groups
  - User roles, personas, user profiling
- Methods for assessing user groups
  - Interviews, questionnaires, focus groups …

- Important Problems
  - Every user is an unique individual (variation in the population)
  - In some cases, users tasks and responsibilities might be more important that individuals preferences but not always…
 - Stereotyped views of users is a dangerous and yet necessary tradeoff

User characteristics
(based on learning skills and usage)

- A simplest classification:
  - Users are: NOVICE or EXPERT
  - Usage is: FREQUENT or INFREQUENT
- Defining user ability
  - Levels of ability e.g. novice, advanced beginner, competent user, proficient user, expert (Dreyfus, 1980)
  - Revised frequency of usage (constant, regular, occasional)
  - Task familiarity (slanted towards technical ability)
  - Degree of usage of similar technology (dissimilar hardware/software).
  - Demographic data (user age and status profile)
  - Value perception (particularly relevant to the introduction of new technology)

Dreyfus, S. E.; Dreyfus, H. L. (February 1980). A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition. Washington, DC: Storming Media.

Ascertain User's Needs

- Define tasks
  - Tasks
  - Subtasks
- Frequency
  - Frequent
  - Occasional
  - Exceptional
  - Repair
- Ex. difference between a space satellite, car engine, and fighter jet
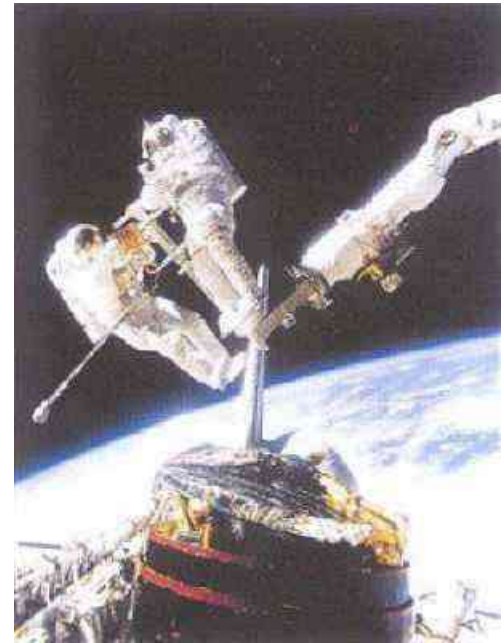
Reliability

- Actions function as specified
- Data displayed must be correct
- Updates done correctly
- Leads to trust! (software, hardware, information) – case: Pentium floating point bug
- Privacy, security, access, data destruction, tampering

Standardization, Integration, Consistency, Portability

- **Standardization** – common user-interface features across multiple applications
  - Apple
  - Web
  - Windows
- **Integration** – across application packages
  - file formats
- **Consistency** – common action sequences, terms, units, layouts, color, typography within an application
- **Portability** – convert data and interfaces across multiple hardware and software environments
  - Word/HTML/PDF/ASCII

Usability Measures

- How can we measure the 'goodness' of an interface?
- What are good metrics?
- ISO 9241
  - Effectiveness
  - Efficiency
  - Satisfaction
- Schneiderman
  - Time to learn
  - Speed of performance
  - Rate of errors
  - Retention over time
  - Subjective satisfaction

Usability Motivations

- Life-Critical systems
  - **Applications**: air traffic, nuclear reactors, military, emergency dispatch
  - **Requirements**: reliability and effective (even under stress)
  - **Not as important**: cost, long training, satisfaction, retention
- Industrial and Commercial Use
  - **Applications**: banking, insurance, inventory, reservations
  - **Requirements**: short training, ease of use/learning, multiple languages, adapt to local cultures, multiplatform, speed
- Office, Home, and Entertainment
  - **Applications**: E-mail, ATMs, games, education, search engines, cell phones/PDA
  - **Requirements**: Ease of learning/use/retention, error rates, satisfaction
  - **Difficulties**: cost, size

Usability Motivations

- Exploratory, Creative, Collaborative
  - **Applications**: Web browsing, search engines, simulations, scientific visualization, CAD, computer graphics, music composition/artist, photo arranger (email photos)
  - **Requirements**: remove the 'computer' from the experience,
  - **Difficulties**: user tech savvy-ness (apply this to application examples)

- Socio-technical systems
  - **Applications**: health care, voting, police
  - **Requirements**: Trust, security, accuracy, veracity, error handling, user tech-savy-ness

Universal Usability

- Interface should handle diversity of users
  - Backgrounds
  - Abilities
  - Motivation
  - Personalities
  - Cultures

- Question, how would you design an interface to a database differently for:
  - A. right-handed female, Indian, software engineer, technology savvy, wants rapid interaction
  - B. left-handed male, French, artist

Universal Usability

- Does not mean 'dumbing down'
  - Ex. Helping disabled has helped others (parents w/ strollers, elderly)
  - Ex. Door handles

- Goal: Address the needs of more users - unlike yourself!

- Everyone is often not at full faculties at all times

Physical Variation

- Ability
  - Disabled (elderly, handicapped, vision, ambidexterity, ability to see in stereo [SUTHERLAND])
  - Speed
  - Color deficiency
- Workspace
  - Science of *ergonomics*
  - Size
  - Design
- Lots of prior research

Physical Variation

- Field of **anthropometry**
  - Measures of what is 5-95% for weight, height, etc. (static and dynamic)
  - Large variance reminds us there is great 'variety'
  - Name some devices that this would affect.
    - note most keyboards are the same
    - screen brightness varies considerably
    - chair height, back height, display angle

- Multi-modal interfaces
 - Audio
  - Touch screens

Cognitive and Perceptual Variation

- Bloom's Taxonomy
  - knowledge, comprehension, analysis, application, synthesis, evaluation
- Memory
  - short-term and working
  - long-term and semantic
- Problem solving and reasoning
- Decision making
- Language and communication

Cognitive and Perceptual Variation

- Language and communication
- Search, imagery, sensory memory
- Learning, skill development, knowledge acquisition
- Confounding factors:
  - Fatigue
  - Cognitive load
  - Background
  - Boredom
  - Fear
  - Drugs/alcohol
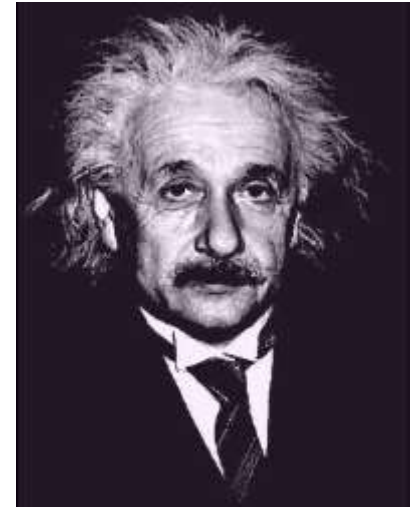
Personality

- Computer anxiety
- Gender
  - Which games do women like?
  - Pac-man, Donkey Kong, Tetris
  - Why? (Hypotheses: less violent, quieter soundtracks, fully visible playing fields, softer colors, personality, closure/completeness)
  - Can we measure this?
- What current games are for women?
- Style, pace, top-down/bottom-up, visual/audio learners, dense vs. sparse data

Personality

- No simple taxonomy of user personality types. Ex. Myers-Briggs Type Indicator
  - Extrovert vs. introvert
  - Sensing vs. intuition
  - Perceptive vs. judging
  - Feeling vs. thinking
- Weak link between personality types and interfaces
- Think about your application, and see if user personality is important!
  - Fighter jets vs. search engines

Cultural and International Diversity

- Language
- Date / Time conventions
- Weights and Measures
- Left-to-right
- Directions (!)
- Telephone #s and addresses
- Names, titles, salutations
- SSN, ID, passport
- Sorting
- Icons, buttons, colors
- Etiquette
- Evaluation:
  - Local experts/usability studies

www.bbc.co.uk/totp2

Taken from 'Top of The Pops:
1962 - 2002' by Jeff Simpson
© BBC

Users with Disabilities

- Federal law to ensure access to IT, including computers and web sites. (1998 Amendment to Rehabilitation Act)
- Disabilities
  - Vision
    - Blind (bill-reader)
    - low-vision
    - color-blind
  - Hearing
    - Deaf
    - Limited hearing
  - Mobility
  - Learning
    - Dyslexia
    - Attention deficient, hemisphere specific, etc.
- Keyboard and mouse alternatives
- Color coding
- Font-size

Users with Disabilities

- Contrast
- Text descriptors for web images
- Screen magnification
- Text to Speech (TTS) – JAWS (web pages)
  - Check email on the road, in bright sunshine, riding a bike
- Speech Recognition
- Head mounted optical mice

Users with Disabilities

- Eye Gaze control
- Learning what helps those with disabilities affects everyone
  - Present procedures, directions, and instructions accessible to even poor readers
  - Design feedback sequences that explain the reason for error and help put users on the right track
  - Reinforcement techniques with other devices
- Good target area for a final project!

Elderly

- Reduced
  - Motor skills
  - Perception
  - Vision, hearing, touch, mobility
  - Speed
  - Memory
- Other needs
  - Technology experience is varied (How many grandmothers use email? mothers?)
  - Uninformed on how technology could help them
  - Practice skills (hand-eye, problem solving, etc.)
- Touch screens, larger fonts, louder sounds

Children

- Technology saviness?
- Age changes much:
  - Physical dexterity
    - (double-clicking, click and drag, and small targets)
  - Attention span
  - (vaguely) Intelligence
- Varied backgrounds (socio-economic)
- Goals
  - Educational acceleration
  - Socialization with peers
  - Psychological - improve self-image, self-confidence
  - Creativity – art, music, etc. exploration

Children

- Teenagers are a special group
  - Next generation
  - Beta test new interfaces, trends
  - Cell phones, text messages, simulations, fantasy games, virtual worlds
- Requires Safety
- They
  - Like exploring (easy to reset state)
  - Don't mind making mistakes
  - Like familiar characters and repetition (ever had to babysit a kid with an Ice Age DVD?)
  - Don't like patronizing comments, inappropriate humor
- Design: Focus groups

Accommodating Hardware and Software Diversity

- Support a wide range of hardware and software platforms
- Software and hardware evolution
  - OS, application, browsers, capabilities
  - backward compatibility is a good goal
- Three major technical challenges are:
  - Producing satisfying and effective Internet interaction (broadband vs. dial-up & wireless)
  - Enabling web services from large to small (size and resolution)
  - Support easy maintenance of or automatic conversion to multiple languages

User groups modeling techniques

- Inferring individuals facts, patterns of user behaviors, condition-action rules
  - Task models
  - Scenarios
- Using stereotypes to infer many things at a time
  - User roles
  - User profiles
  - Persona

User characteristics to consider

- Demographic data:
  - Age, gender, education, occupation, cultural background, special needs, computer training and knowledge, experience with similar systems/products

- Traits and intelligence:
  - cognitive styles, affective traits, skill sets or capability

- Job or task related factors:
  - job characteristic, knowledge of application and job familiarity, rate of use of the computer (in work)

User profile

- Fictitious summary including motivation, goals and personalities

- Includes information about, age, gender, skills, education level, experience, cultural level

Describing the main user characteristics

- Personal characteristics:
    - Age, sex, education, job type, socio-economic status, role in organization.
    - Lifestyle, personality, emotions and attitudes (e.g. toward using a technology).
    - Skills.
    - Physical abilities and constraints, e.g. poor eyesight, color blindness, etc.
- Task related characteristics:
    - Goals and motivation.
    - Tasks.
    - Usage (heavy vs. light, frequency, indirect or remote).
    - Training and experience (from novice to expert).
- Geographic and social characteristics:
    - Location: regions, countries, continents, market areas.
    - Cultures and other circumstances.
    - Social connections and societies.

Example

1. **# of users** that occupy this user type
2. **General responsibilities or activities**
3. **Computer skills**
4. **Domain expertise**
5. **Goals:** how does the tool help this user reach their goals?
6. **Pain Points:** what nagging problems can the tool help to solve?
7. **Usage Contexts:** where will the tool be used?
8. **Tool Ecosystem:** what other tools does this user type rely on?
9. **Collaborators:** who does this user work with to help reach their goals?
10. **Frequency of Use:** how often is this type of user likely to use the tool?

To help understanding the characteristics of users/customers that might have bearing on the design, construct a profile containing information about the type of user relevant to the tool being created.

Characteristics suitable for this user type (design imperatives)

- **ease of learning**
- **retention** of learning
- **efficiency** of interaction
- **reliability** of interaction
- user **satisfaction**
- user **convenience**
- necessity for **proficiency**
- importance of **accuracy**

Design for the target audience

- Ex. e-commerce application for selling games for kinds

Audience	Criteria
Parents	Price Security Durability Time spent for buying
Teachers	Price Security Educational value Useful in classes
Friends	Suggestions for gifts Ordered by age Time and costs of delivering Il vient avec papier cadeaux ?
Children	Is it fun? It is new? Are children allowed to buy on-line?

User roles

- A collection of attributes that characterize certain user population and their intentional interaction with the system

- Task and responsibility based

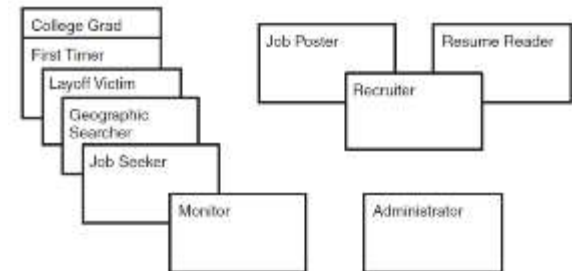- Individual preferences does not matte here

User roles: a simple example

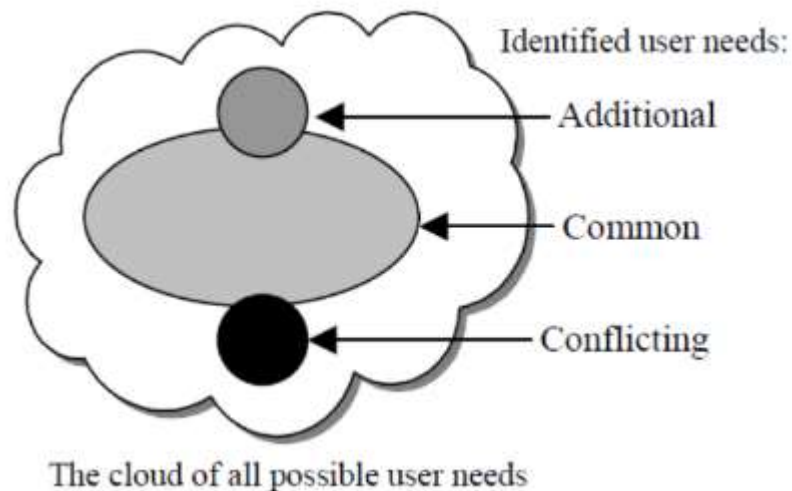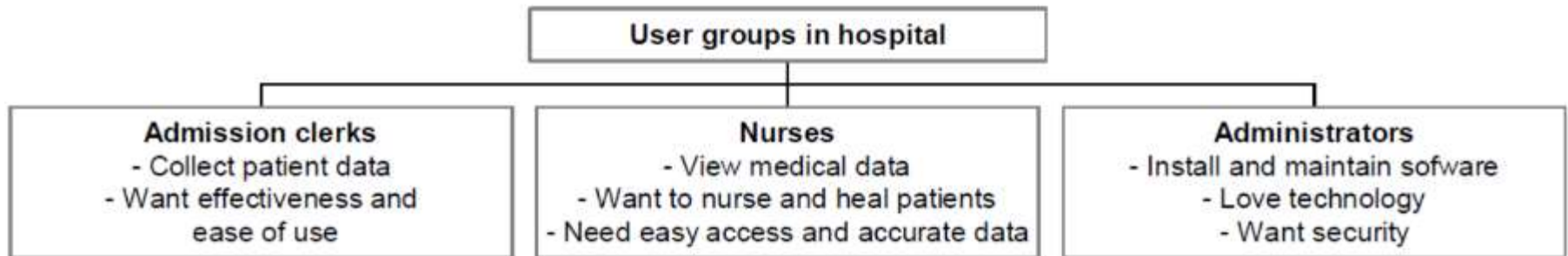| User group	Task	Number of users
Admission clerks	Collect patient data	25
Nurses	View medical data	490
Administrators	Install and maintain software	12

Role Modeling Steps

- brainstorm an initial set of user roles
  - A user role is one user
  - System roles are also useful
- organize the initial set of cards
  - Tasks and responsabilities
- consolidate roles
- refine the roles
  - The frequency with which the user will use the software.
  - The user's level of expertise with the domain.
  - The user's general level of proficiency with computers and software.
  - The user's level of proficiency with the software being developed.
  - The user's general goal for using the software. Some users are after convenience,
  - others favor a rich experience, and so on.

Role	Who
Job Seeker	Scott
First Timer	Laura
Layoff Victim	Kindra
Geographic Searcher	Allan
Monitor	Ashish
Job Poster	Mario, Savannah
Resume Reader	Delaney, Savannah

Priorities and conflicts between user groups

User groups in hospital

Admission clerks	Nurses	Administrators
- Collect patient data	- View medical data	- Install and maintain sofware
- Want effectiveness and ease of use	- Want to nurse and heal patients	- Love technology
	- Need easy access and accurate data	- Want security

Identified user needs:
- Additional
- Common
- Conflicting

The cloud of all possible user needs

Personas

- Technique based on data gathered through user research, mapping user archetypes (profiles), that represent a few important classes of users' goals and needs
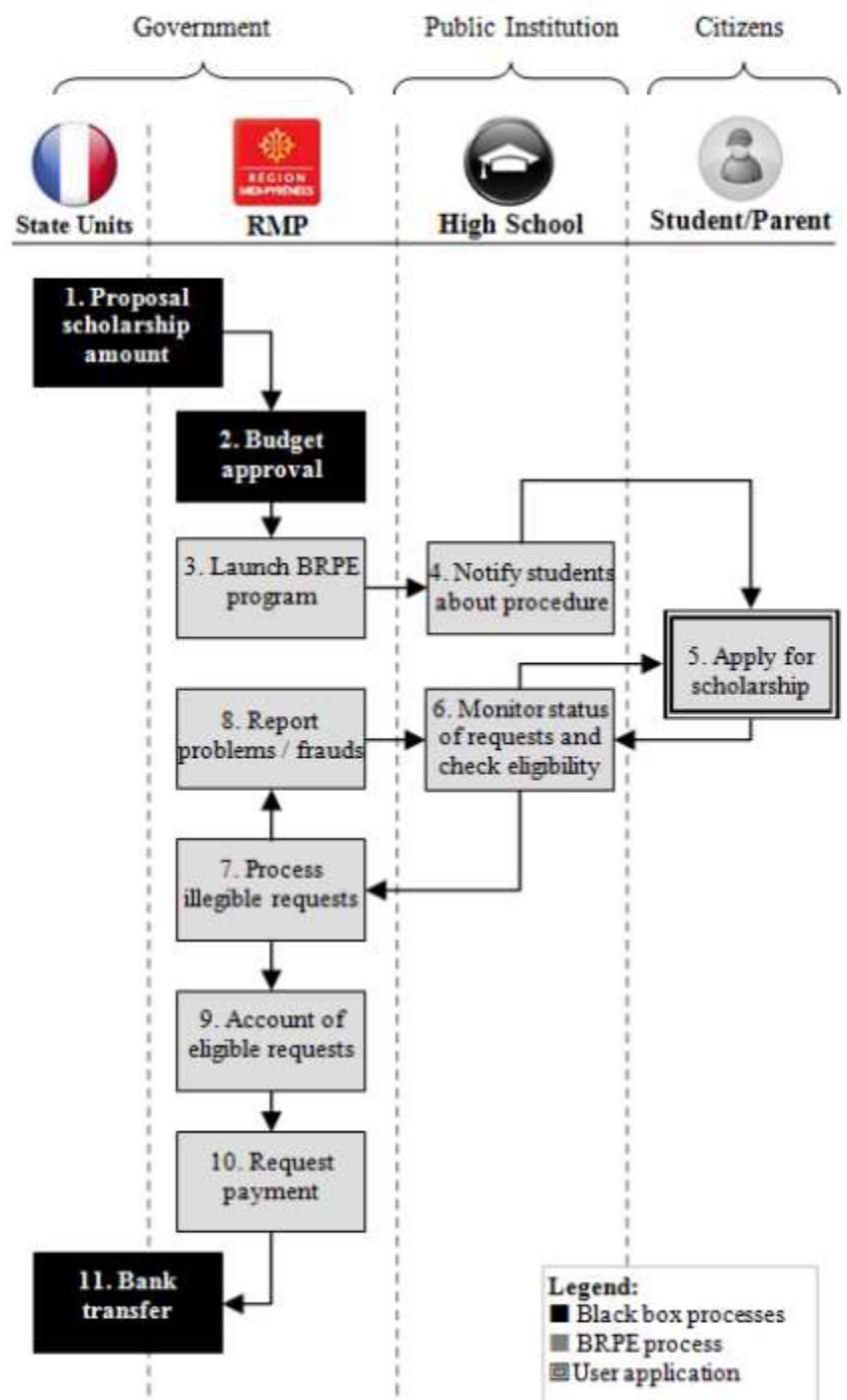
Build a simple persona

- Include:
  - Name
  - A role or job title
  - Quotes in the personas language
  - Relevant demographics
  - Descriptions that reveals goals, motivations, pain points
  - Descriptions that describe primary activities this user type will engage in.

Case study BRPE

| Users	Criteria
RMP stakeholders	Costs
	Prevent frauds
	Time for checking eligible applications
	Traceability of applications
High school's principals	Visibility on students applying for the scholarship in his/her institution
	Time for checking eligible applications (e.g. no required information is missing)
	Time for assisting students to filling in the forms
	Pedagogical value of procedures in daily life
Citizens	Ensure eligibility of application
	Time for filling in the forms
	Time for obtaining the scholarship
	Full transparency

Government — State Units — RMP
Public Institution — High School
Citizens — Student/Parent

1. Proposal scholarship amount
2. Budget approval
3. Launch BRPE program
4. Notify students about procedure
5. Apply for scholarship
6. Monitor status of requests and check eligibility
7. Process illegible requests
8. Report problems / frauds
9. Account of eligible requests
10. Request payment
11. Bank transfer

Legend:
■ Black box processes
▨ BRPE process
▣ User application

Personas for BRPE

First name	Rémi, the nature boy
Age	16 years old
Nationality	French
Family status	Single, living with his parents in a farmer.
Education	Repeating first year at the vocational high school Saint Paul on Veterinary Scholar Program after failing a first year in a traditional high school.
Information Technology skills	He prefers to surf the Web at school because of the low Internet bandwidth in the rural area where he lives. He gave up with cell phones because of the poor mobile network in the farmer.
Motivation for using new information technologies	He does not have any specific motivation but he knows how to use computer to check his assignments at the electronic kiosk available at the school.
Professional projects	To finish high school and go back to the farm to work with his father.

First name	Iban, the artist
Age	18 years old
Nationality	French
Family status	Single. Part time job in a restaurant after classes and during weekends. Living with friend in an apartment rented by his parents who live in another city.
Education	First year of vocational program in arts at the high school Matisse after two years attending Plumbing program at the same high school.
Information Technology skills	In the top 5 students in informatics. He is very skilled with drawing programs.
Motivation for using new information technologies	He likes innovative IT solutions and he very keen to try new devices. He was a first adopter of iPhone. Since then, he is using it to show his paintings everywhere he goes.
Professional projects	Work in the game industry.

Prototyping scenarios
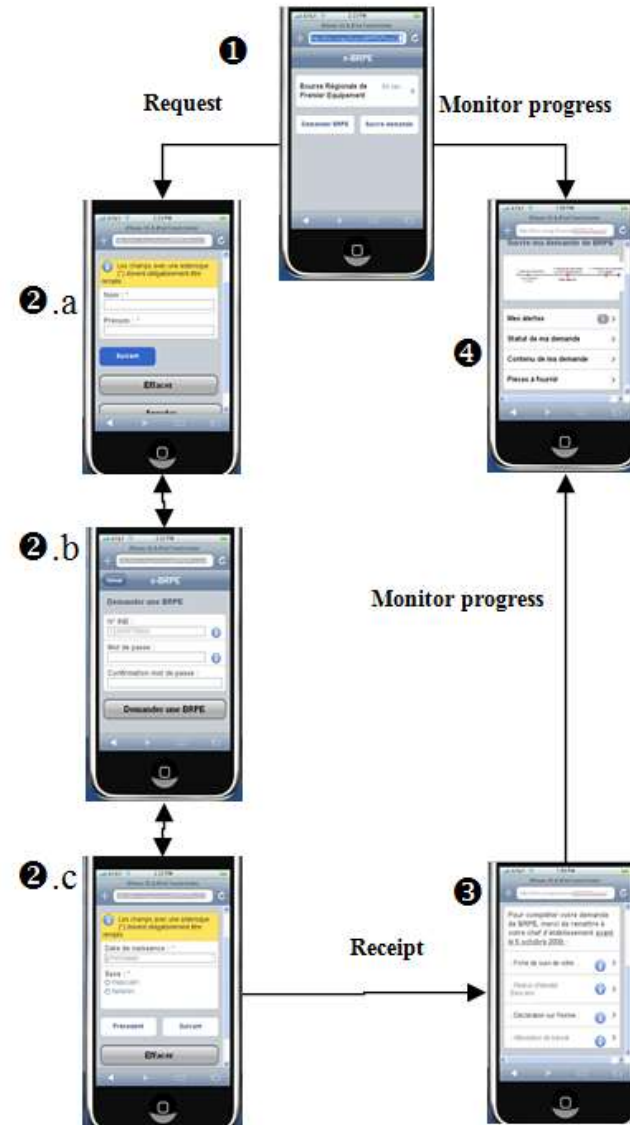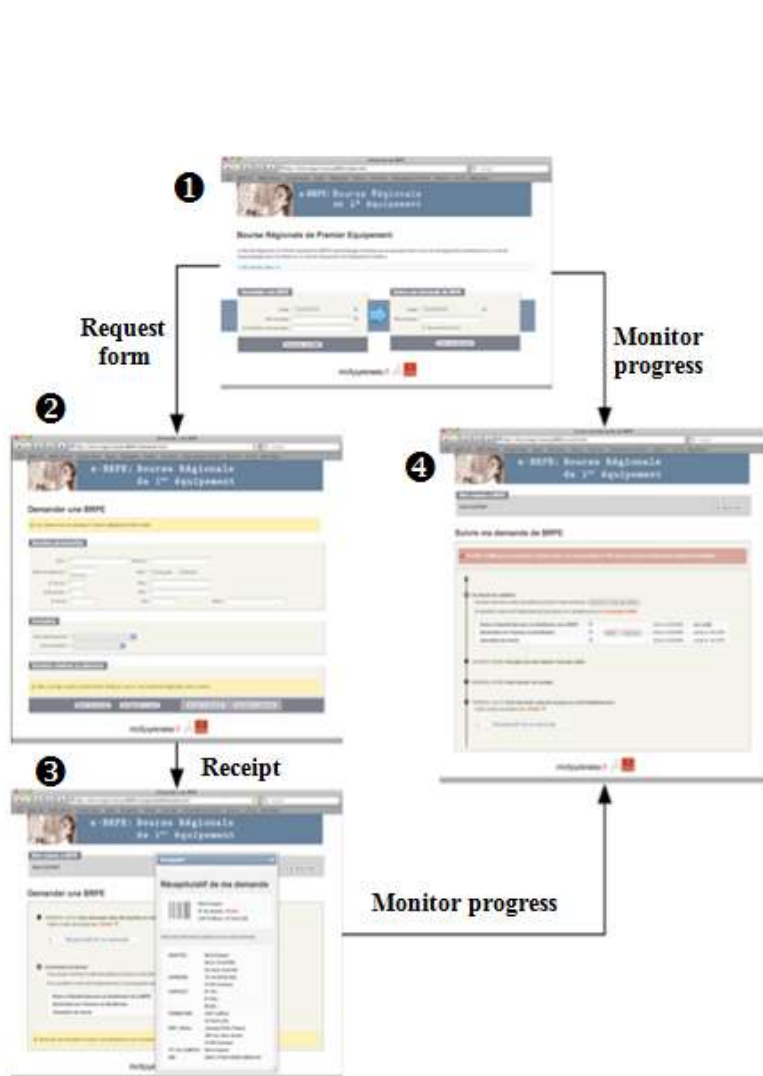
Creating scenarios and user stories

- White down representatives users tasks with the Web application
- Identify users tasks for each kind of user in all contexts of use
- Define:
    - Context of use (street, work, home, etc …)
    - How the system help to perform the task
    - What is required to perform the task
    - How important the task is for the user?

How to write a user story

- Separation of the user/customer types' goals (previous slides)
- Template: As a <some role>, I want <something>, so that <some value>
    - Describes **who** wants, **what** wants and **what for** in one sentence
    - Examples:
        - "As an end user I want to be able to upload my picture to my profile page, so that my profile page looks cool"
        - "As a sales person, I want to see statistics of my performance in graphical charts, so that I monitor my performance"
        - "As an administrator, I want to have database backups, so that I won't be in big trouble if something unexpected happens"
- User story **does not** define any details of the **implementation**!
- Every user story needs a Definition of Done (acceptance criteria)

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