

Mobile and Context-aware Interactive Systems



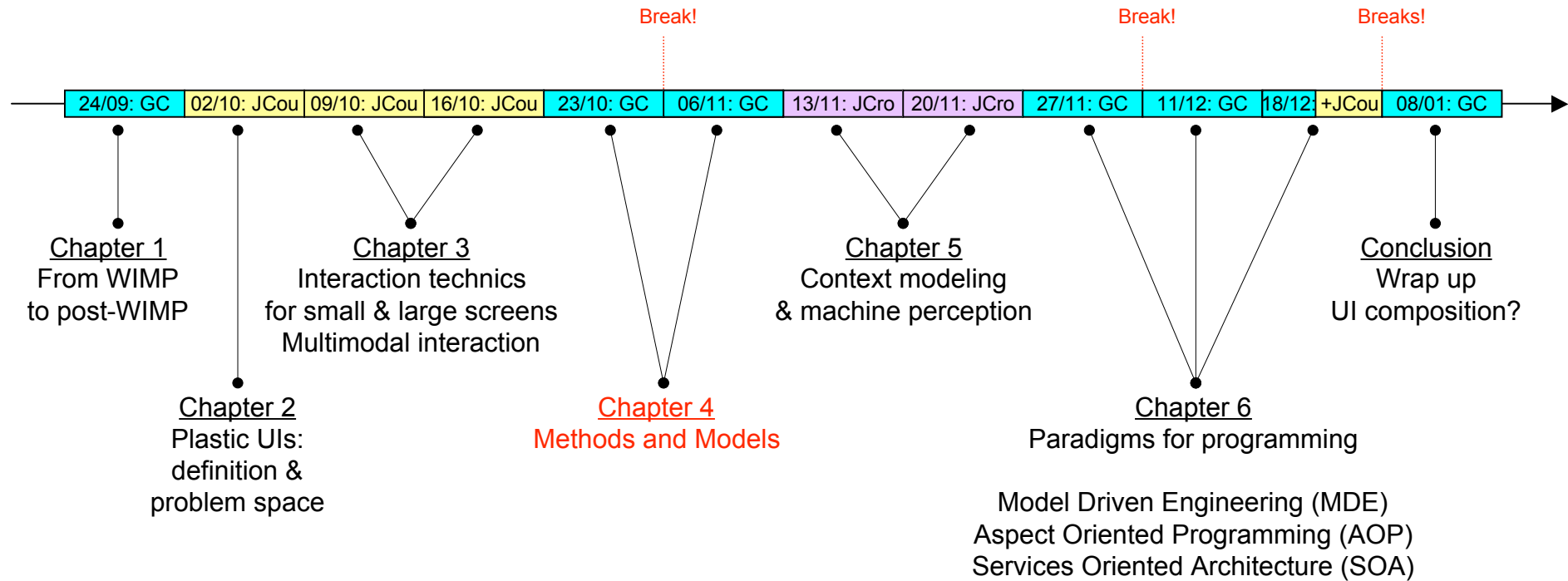
Gaëlle Calvary, Joëlle Coutaz and James Crowley

Université Joseph Fourier (Grenoble I)
ENSIMAG

Laboratoire d'Informatique de Grenoble (LIG)

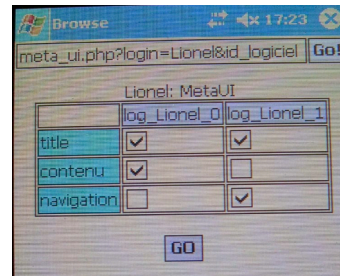


Outline and schedule



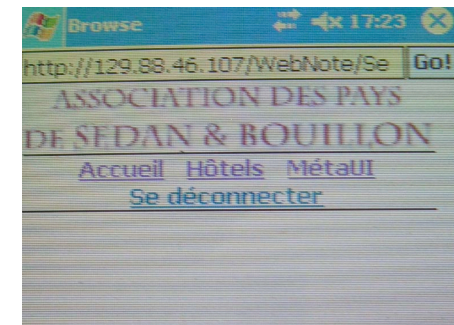
GC: Gaëlle Calvary
JCou: Joëlle Coutaz
JCro: James Crowley

How ?



Event: *Connection of the PDA*

Reaction: *Proposition of a UI's redistribution*

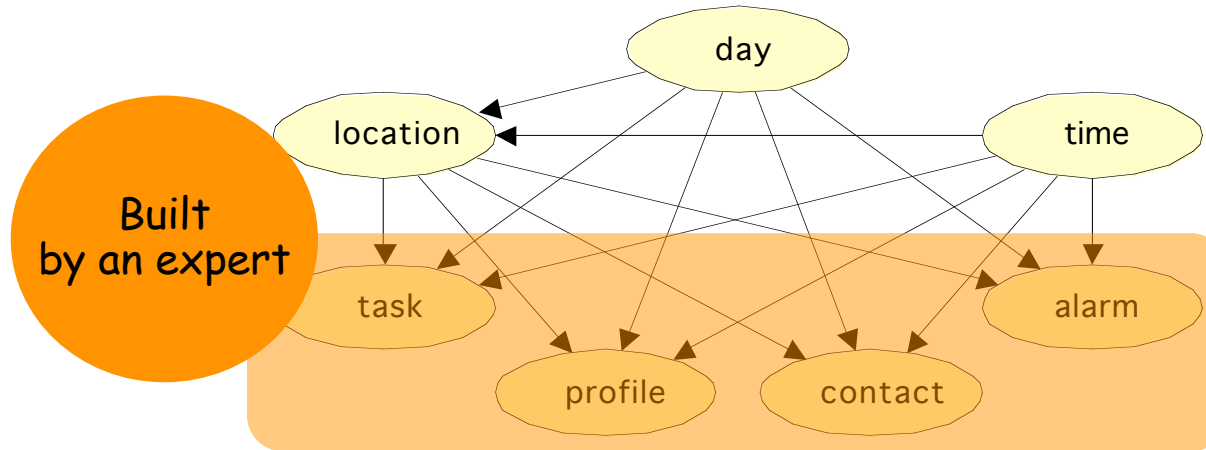




- 0- Understand the user's task!

- 1- Identify the key contexts of use to be covered
 - It can be done by
 - The designer based on a requirements analysis
 - The system using a *probe* [Ganneau 08]
 - Examples of variables that can be observed *in situ* on a mobile
 - Location (GPS)
 - Time (day and time)
 - Physical state of the mobile (battery)
 - User's activity (applications used and under use)
 - One approach: User modeling by Bayesian networks
 - Examples of exploitation
 - Observability of the context of use
 - User actions anticipation [Cypher 91]

- Bayesian network (Netica on mobile)



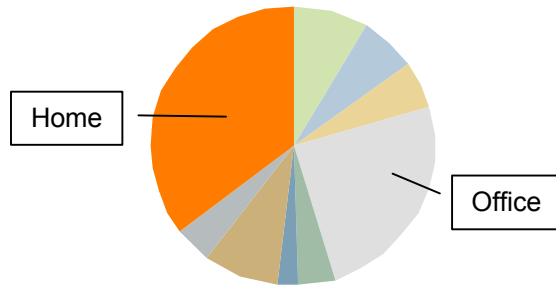
- Raw data

<i>Location</i>	<i>Day</i>	<i>Time</i>	<i>Task</i>
CID3382BAC10241	Monday	Morning	Call
CID3382BAC10241	Monday	Morning	Games
...
CID5535BAC10241	Wednesday	Evening	SMS
CID5535BAC10241	Wednesday	Evening	Contacts

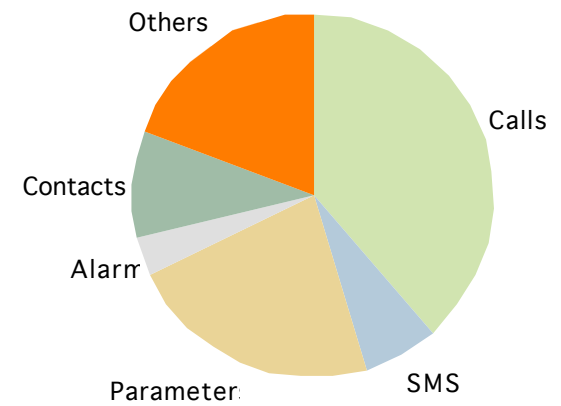
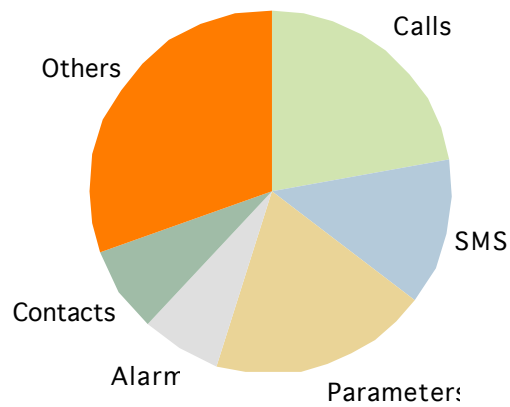
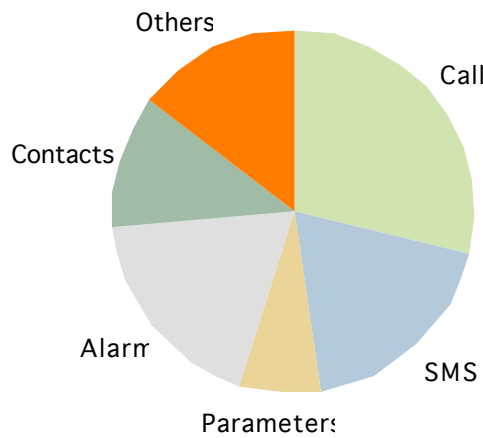
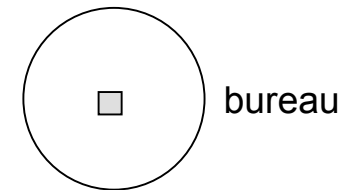
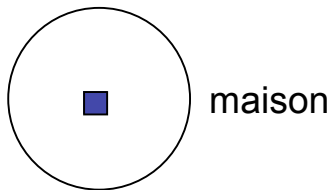
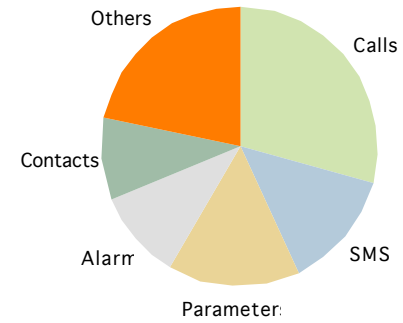


Methods

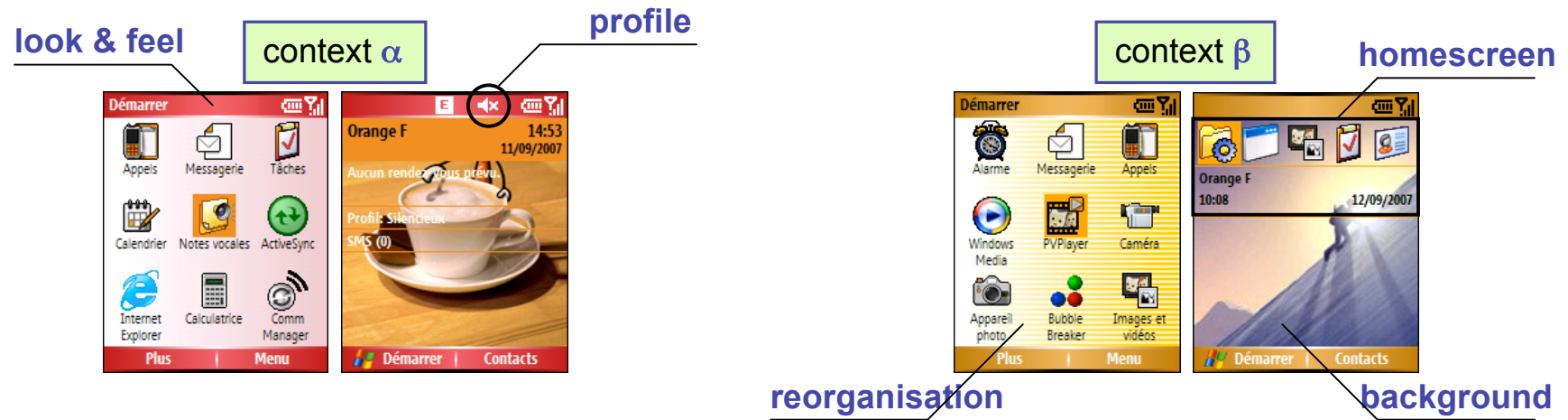
Data analysis



- CID64138LAC10241
- CID45997LAC10241
- CID05502LAC10241
- CID55353LAC10241
- CID35039LAC12041
- CID00973LAC12041
- CID47966LAC12041
- CID03969LAC12041
- CID33829LAC10241



- Impact on the UI's design



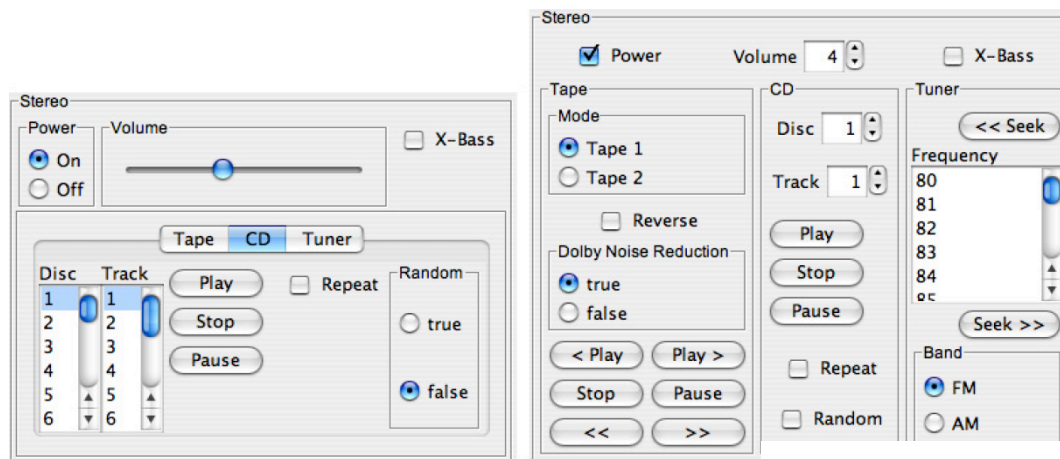
Trust?

Ethics?



Methods

- 2- Design the UIs for the key contexts of use
 - It can be done by
 - The designer: *pre-computed* UIs
 - The system: *generated* UIs
 - The end-user: *customized* UIs

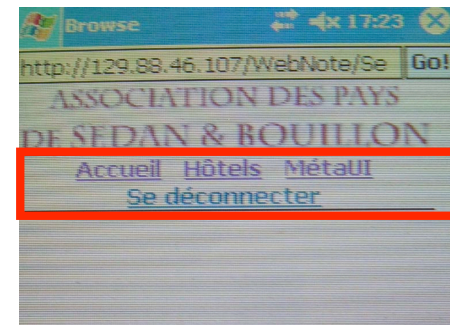


[Gajos 2004]

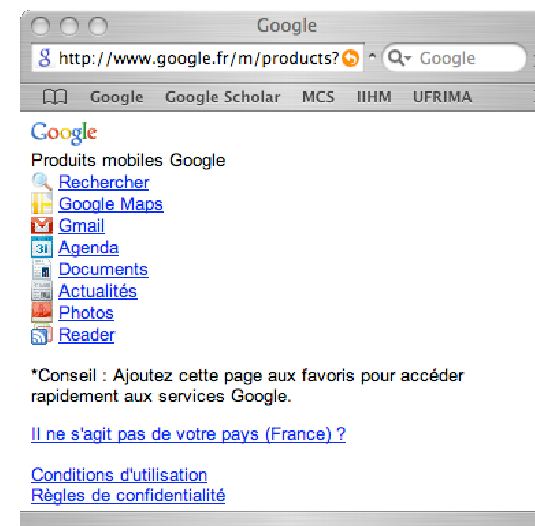


WinApp

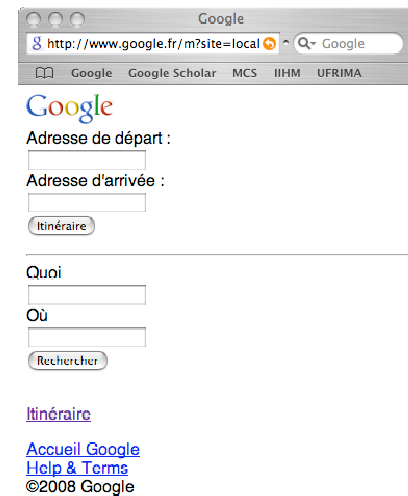
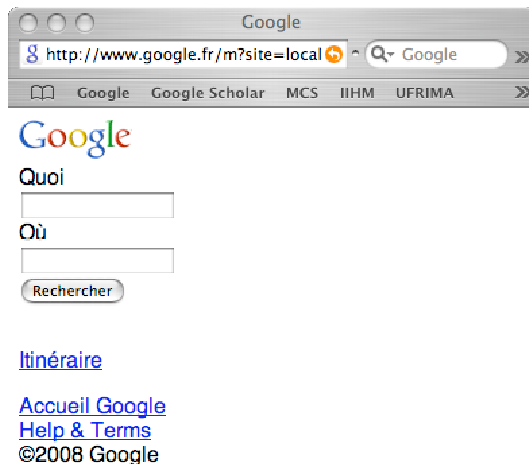
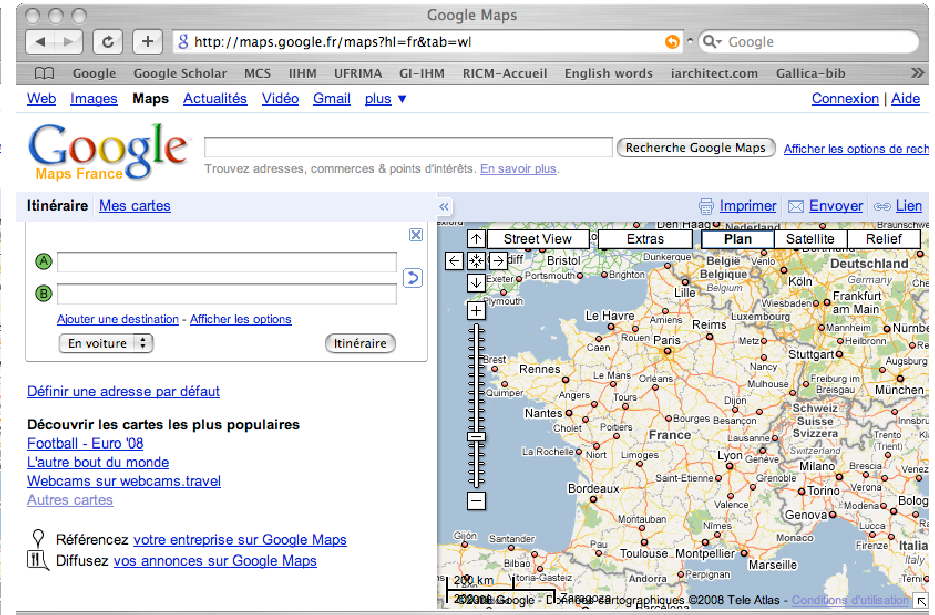
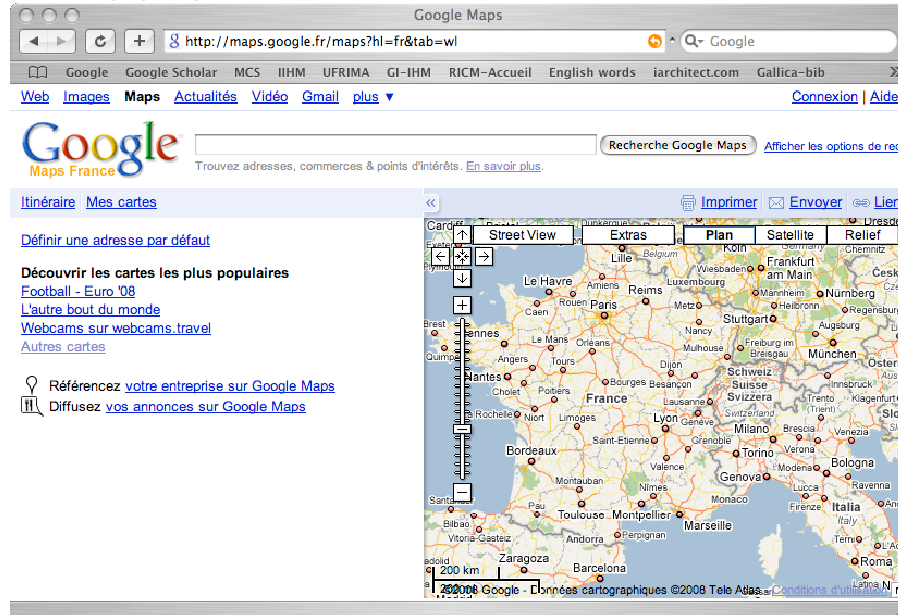
- 2- Design the UIs for the key contexts of use
 - Open issues
 - Consistency
 - Consistency / inconsistency? [Workshop @CHI'06]



- Exercise 1: Point out the discrepancies between Google and Google mobile

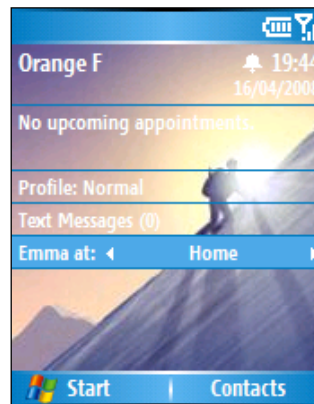
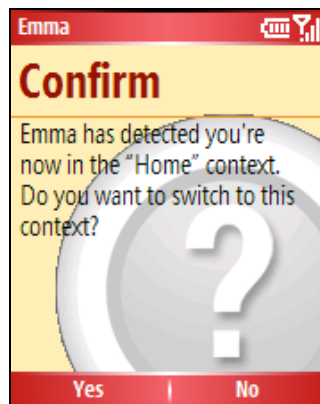
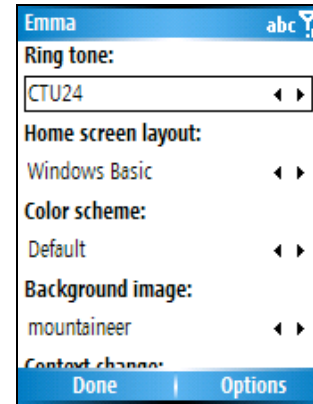
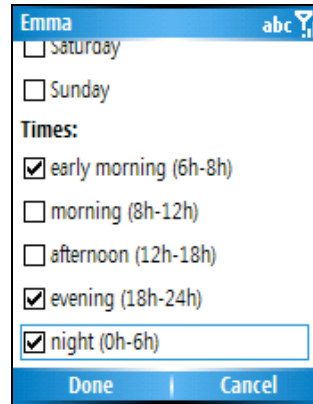
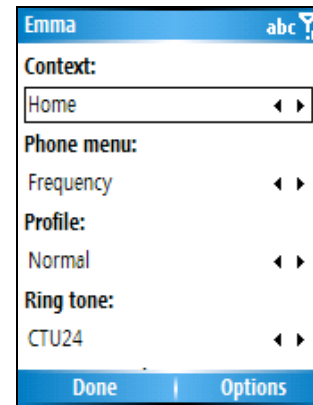
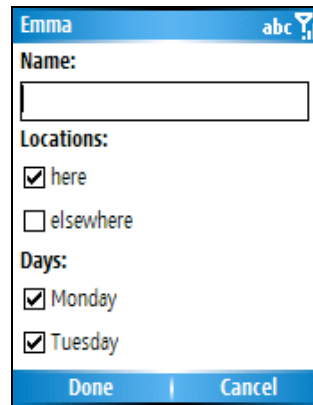
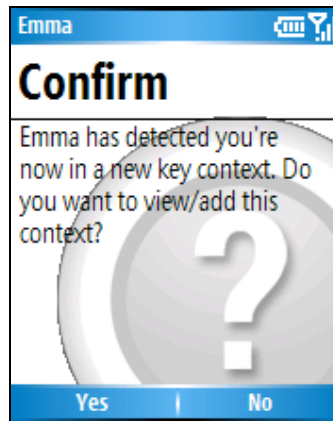


■ Exercise 1: Point out the discrepancies between Google and Google mobile





- 2- Design the UIs for the key contexts of use
 - Open issues
 - Consistency
 - Consistency / inconsistency? [Workshop @CHI'06]
 - Reference platform?
 - Degradation [Florins 2006]
 - Beautification
 - Inter-usability [Karsenty 05]
 - Additional UIs (observability and/or control)
 - Context of use
 - Evolution
 - Transition



- 2- Design the UIs for the key contexts of use

- Context of use -

User

Platform

Environment

- Adaptation -

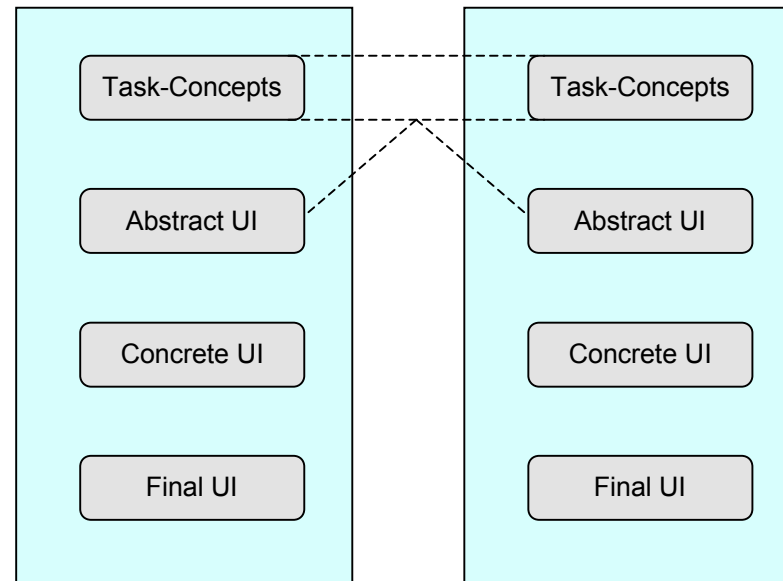
Evolution

Transition

- Quality in use -

Criteria

Metrics



Also in the UI ...

- 2- Design the UIs for the key contexts of use
 - Exercise 2: Classify the Google's discrepancies

- Context of use -

User

Platform

Environment

- Adaptation -

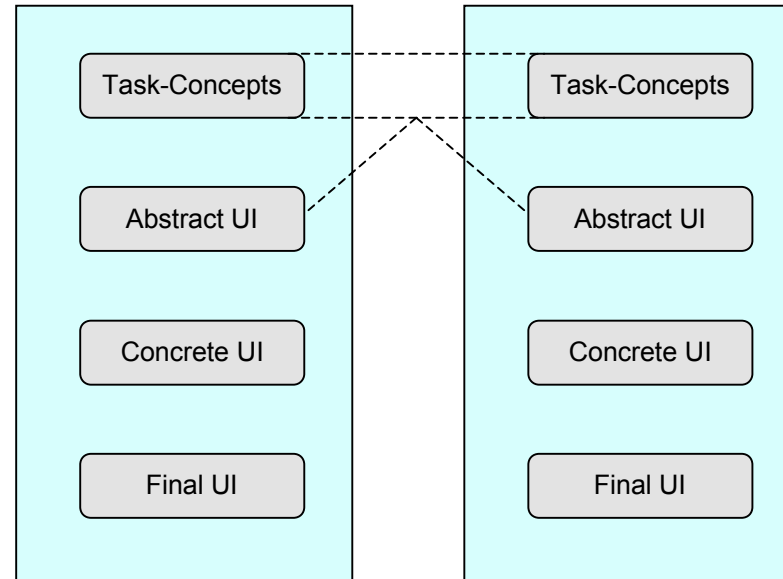
Evolution

Transition

- Quality in use -

Criteria

Metrics



Also in the UI ...

- 2- Design the UIs for the key contexts of use
 - Many entry points



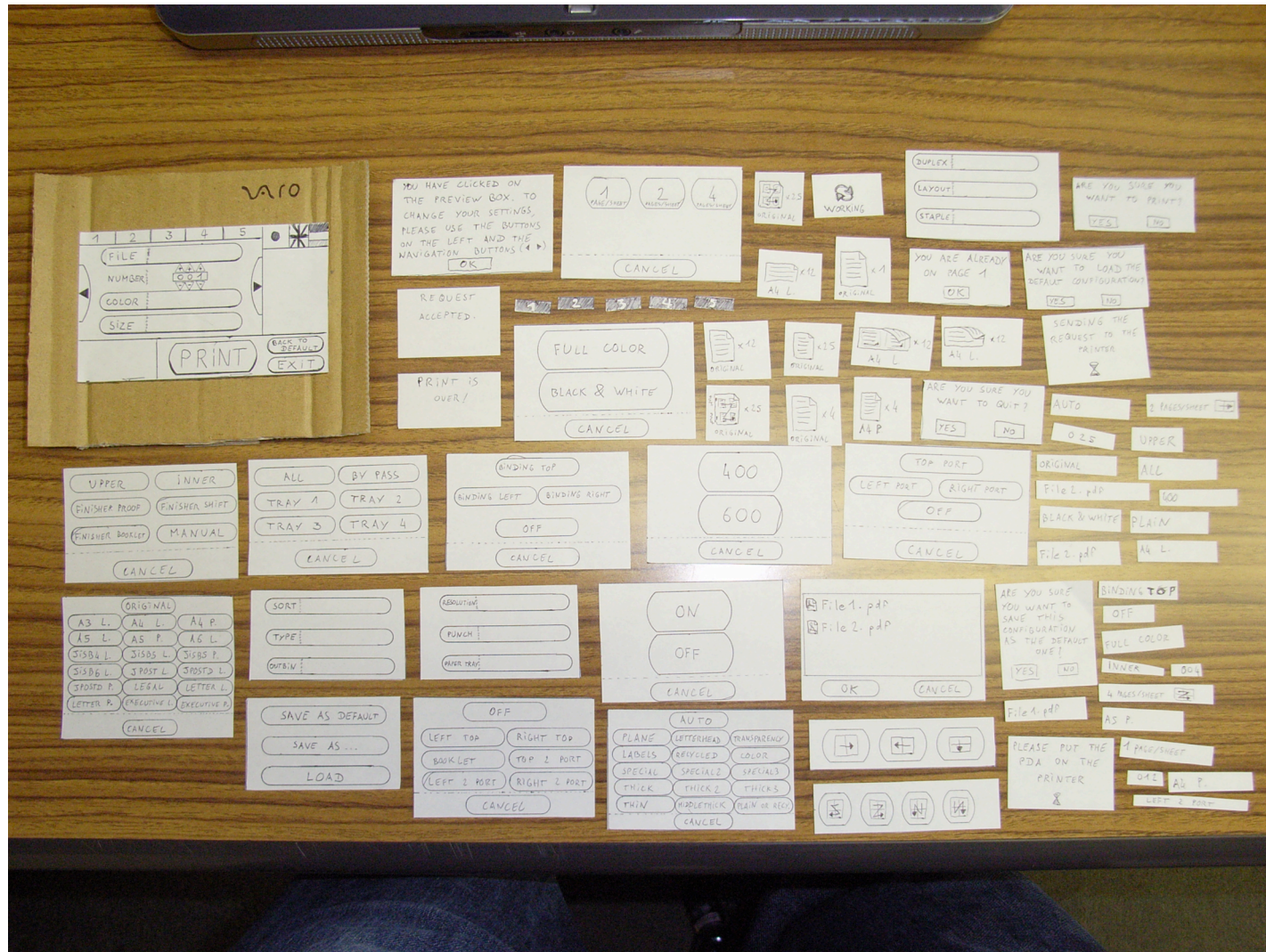
- 2- Design the UIs for the key contexts of use
 - Many entry points





Methods

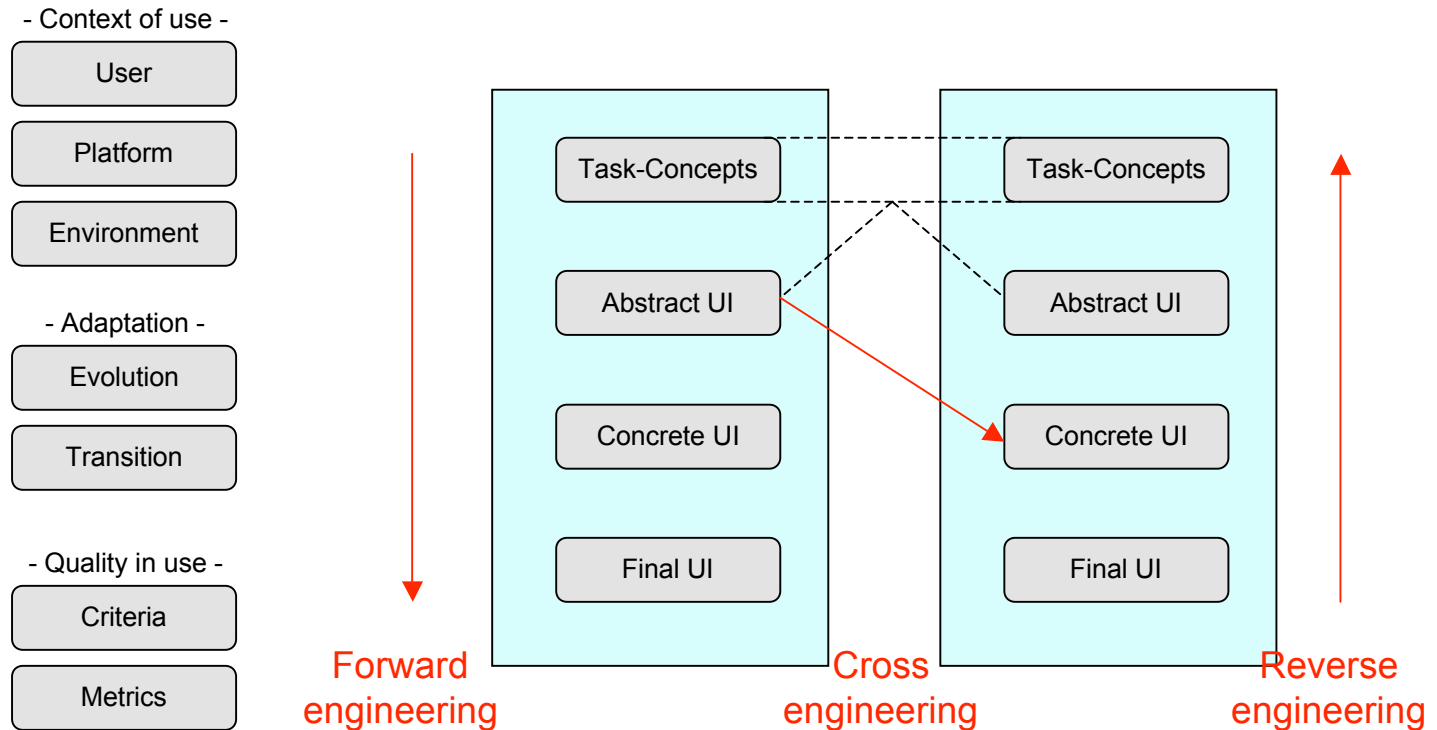
- 2- Design the UIs for the key contexts of use
 - Many entry points



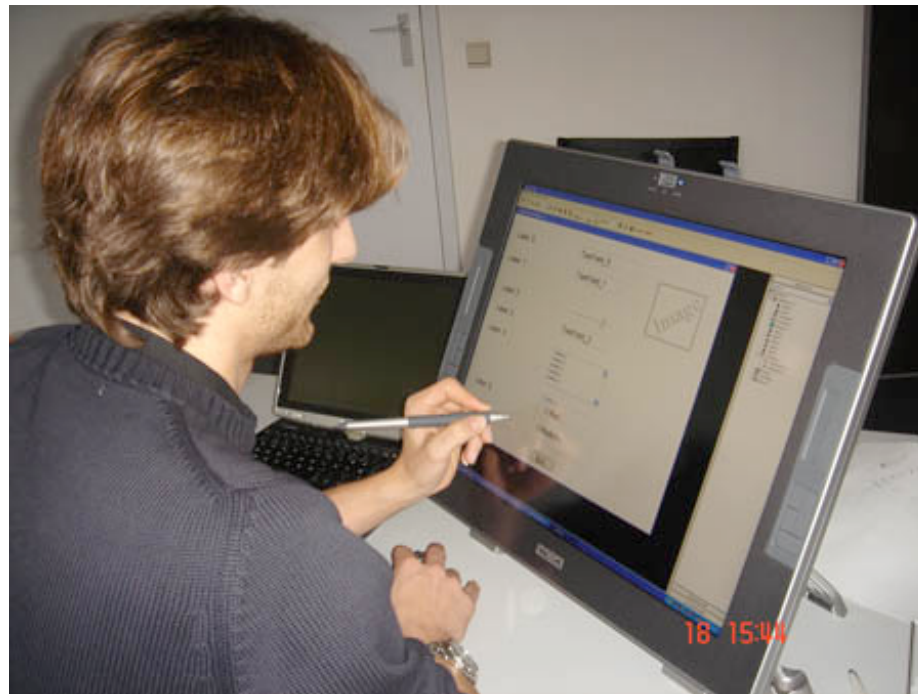


Methods

- 2- Design the UIs for the key contexts of use
 - Many entry points
 - Many design paths



- 2- Design the UIs for the key contexts of use
 - Many entry points
 - Many design paths
 - Many tools



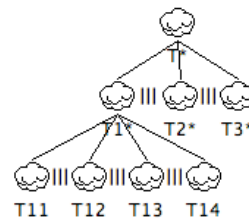
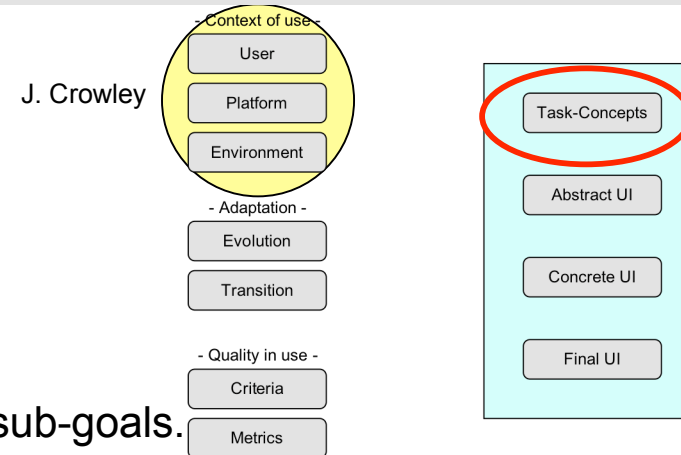


- 3- Evaluate
 - In labs
 - In situ
 - Challenging while in mobility ... probes

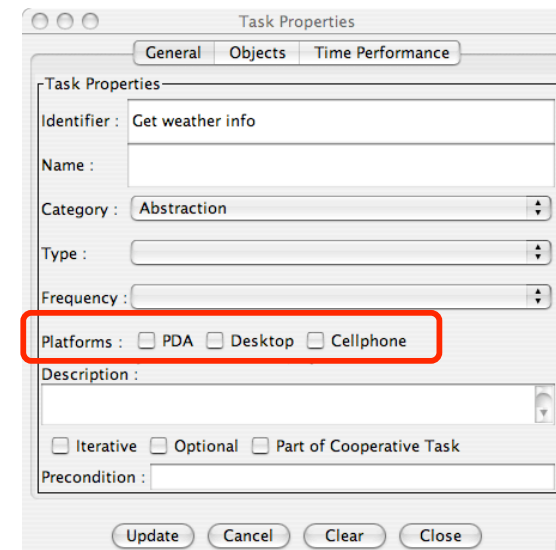
- Context of use
 - See J. Crowley

- Design of the UI
 - Task & concepts model

- Task: A decomposition of the user's goal into sub-goals. CTT [Paterno, 97] is the reference in task modeling.
- (Sub-)tasks may be decorated (e.g., domain concepts, frequency, criticality ... as well as the « Context of use » in which the task makes sense)
- Concepts: A description of the data that are manipulated by the user. They can be described as a UML class diagram.

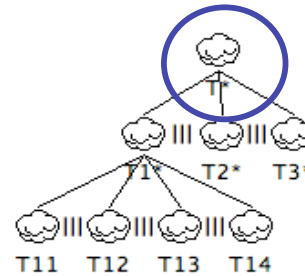


A CTT task model [Paterno, 97]

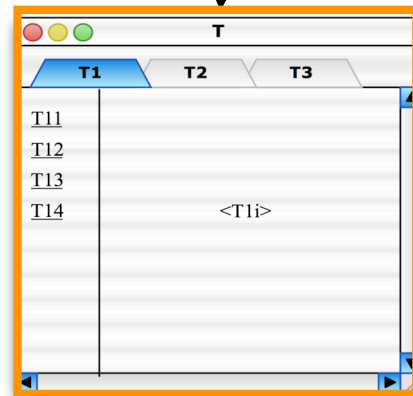
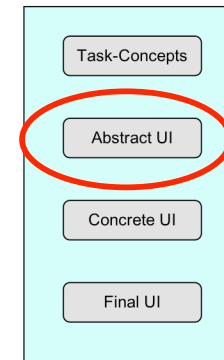


- Abstract UI

- An organization of the UI into workspaces and navigation (i.e., *gives access to*)
- It is the result of a grouping process (e.g., group together the frequent tasks)



- Context of use -
 - User
 - Platform
 - Environment
- Adaptation -
 - Evolution
 - Transition
- Quality in use -
 - Criteria
 - Metrics



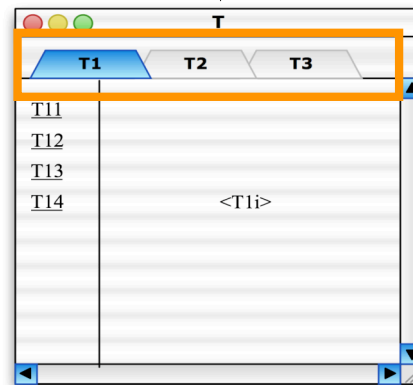
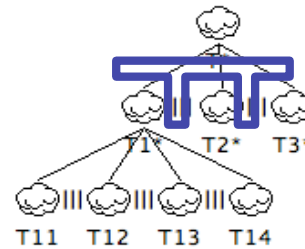
Browsability



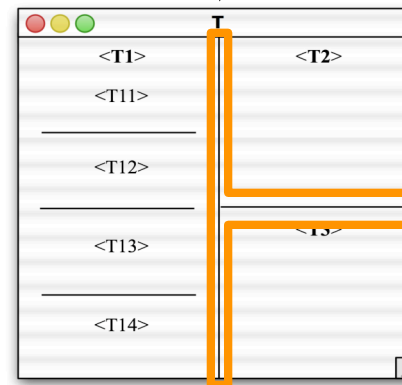
Observability

- Abstract UI

- An organization of the UI into workspaces and navigation (i.e., *gives access to*)
- It is the result of a grouping process (e.g., group together the frequent tasks)



Browsability



Observability

- Context of use -

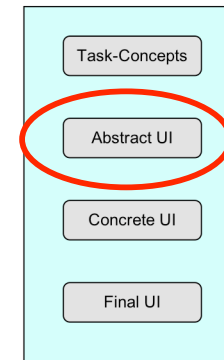
- User
- Platform
- Environment

- Adaptation -

- Evolution
- Transition

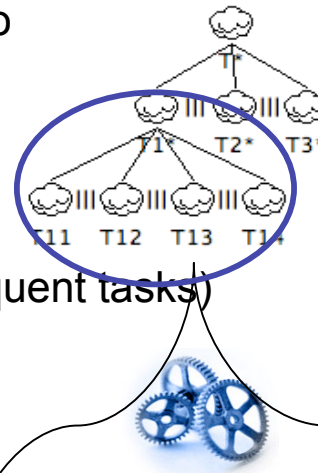
- Quality in use -

- Criteria
- Metrics

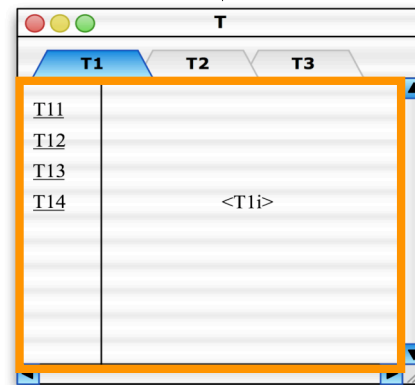
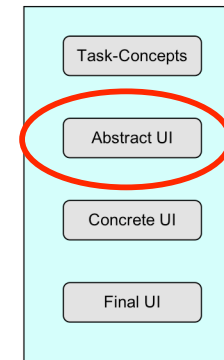


■ Abstract UI

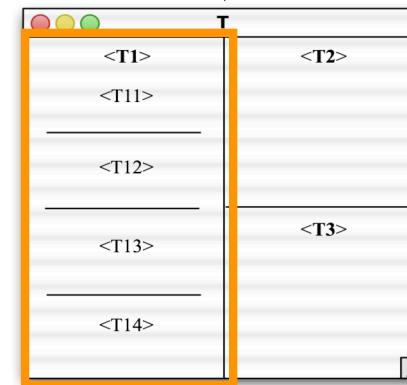
- An organization of the UI into workspaces and navigation (i.e., *gives access to*)
- It is the result of a grouping process (e.g., group together the frequent tasks)



- Context of use -
 - User
 - Platform
 - Environment
- Adaptation -
 - Evolution
 - Transition
- Quality in use -
 - Criteria
 - Metrics



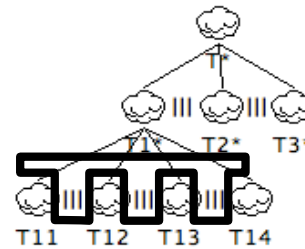
Browsability



Observability

■ Abstract UI

- An organization of the UI into workspaces and navigation (i.e., *gives access to*)
- It is the result of a grouping process (e.g., group together the frequent tasks)



- Context of use -

User

Platform

Environment

- Adaptation -

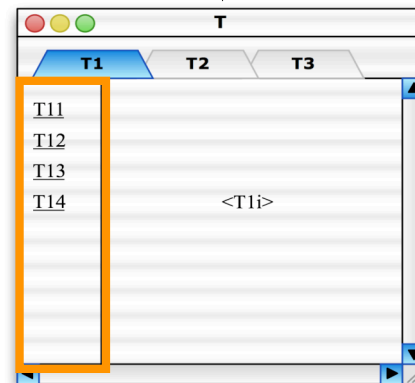
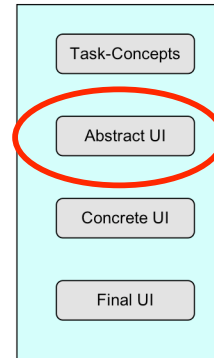
Evolution

Transition

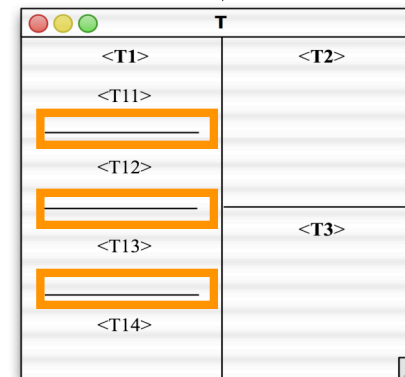
- Quality in use -

Criteria

Metrics



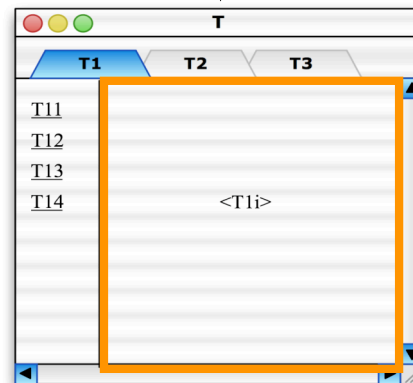
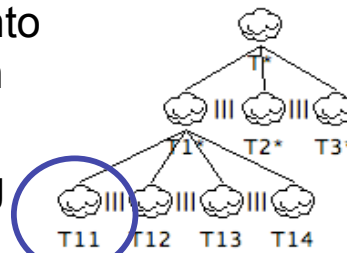
Browsability



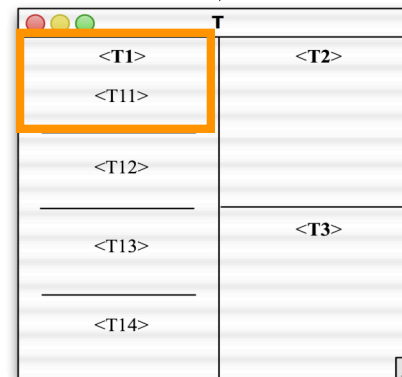
Observability

- Abstract UI

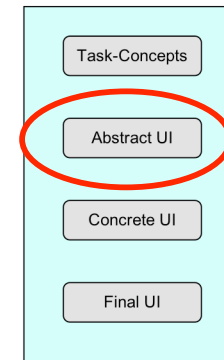
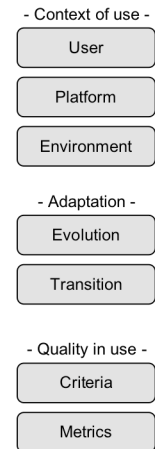
- An organization of the UI into workspaces and navigation (i.e., *gives access to*)
- It is the result of a grouping process (e.g., group together the frequent tasks)



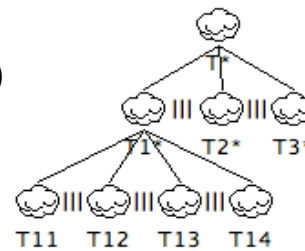
Browsability



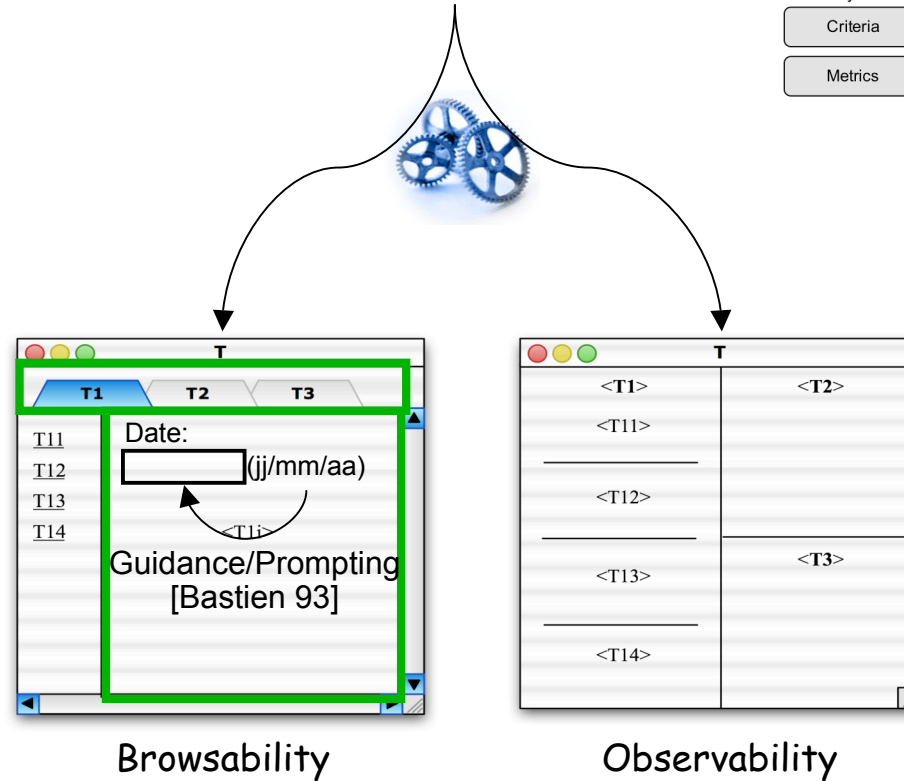
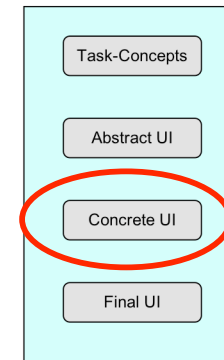
Observability



- Concrete UI
 - A composition of interactors (e.g., input field, radio button)
 - Is obviously dependent on the platform



- Context of use -
 - User
 - Platform
 - Environment
- Adaptation -
 - Evolution
 - Transition
- Quality in use -
 - Criteria
 - Metrics



- Final UI

- A choice of a programming language and an execution environment
- Interactors/components can be close/open adaptive
- UI's may be pre-computed or generated on the fly

- Context of use -

User

Platform

Environment

- Adaptation -

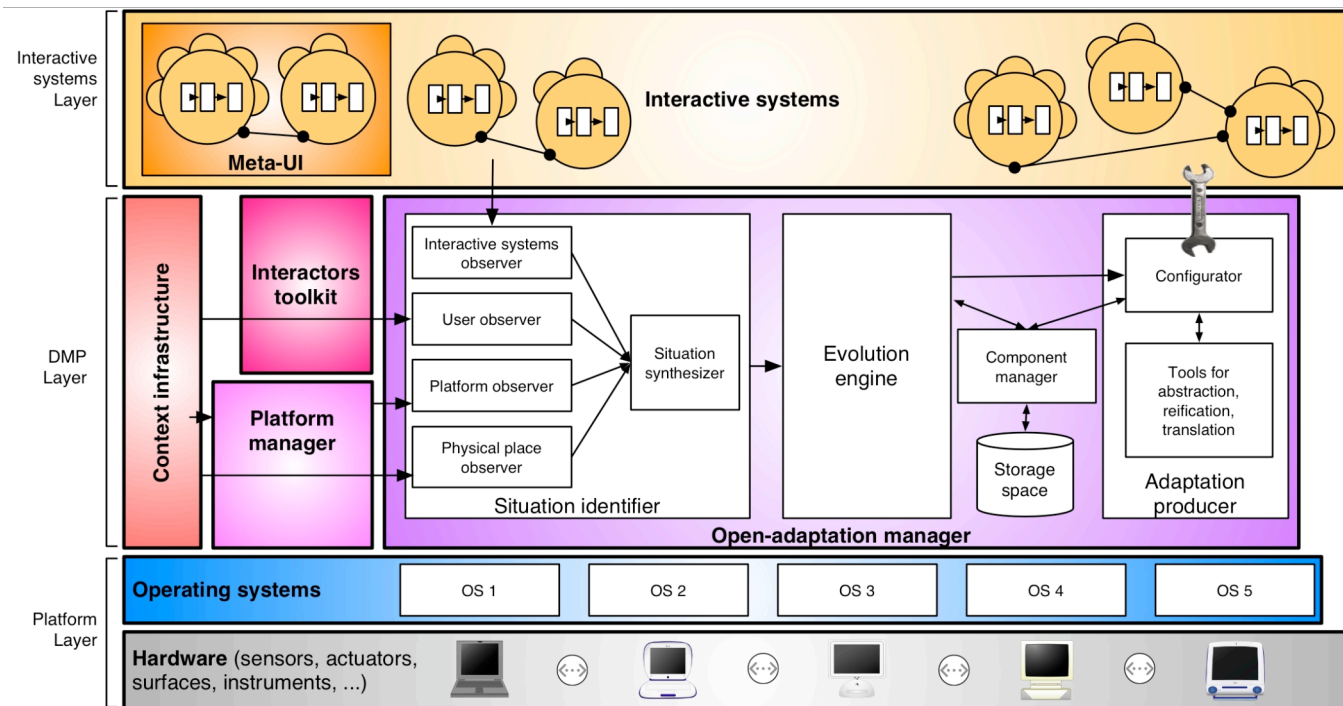
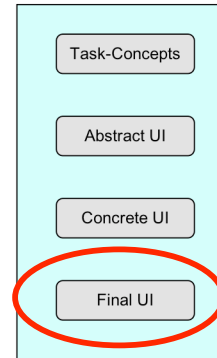
Evolution

Transition

- Quality in use -

Criteria

Metrics



- Adaptation models

- Evolution

- ECA+V Rules:

- On *event* if *condition* then *action* ensures *value*

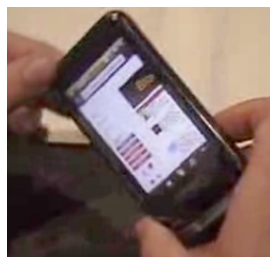
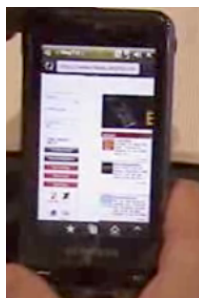
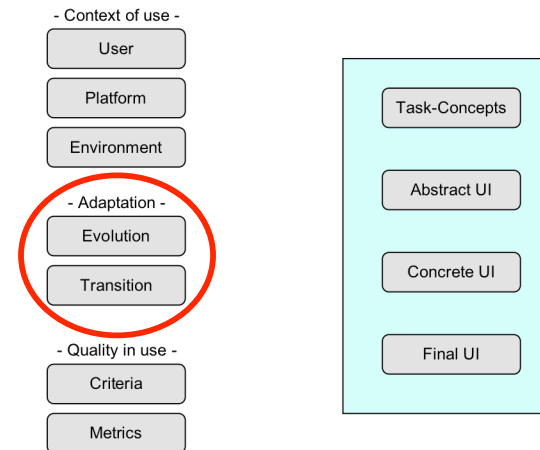
- Evolution rules may be placed under the control of the end-user via a dedicated UI.

- This UI can be weaved into the *business* UI

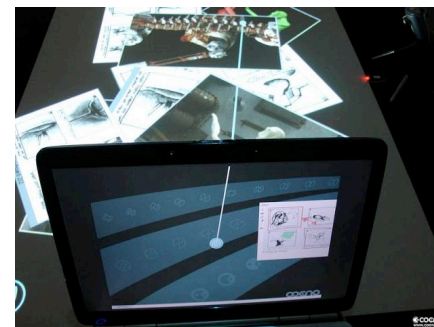
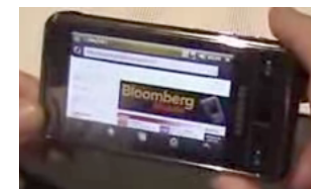
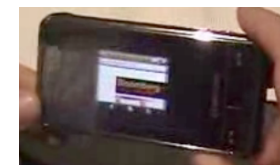
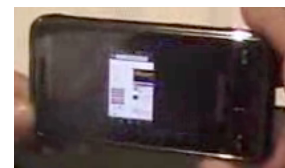
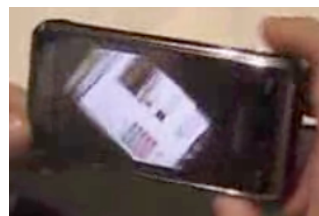
- Transition

- A user's guidance

- It may be useful while remodeling as well as redistributing the UI

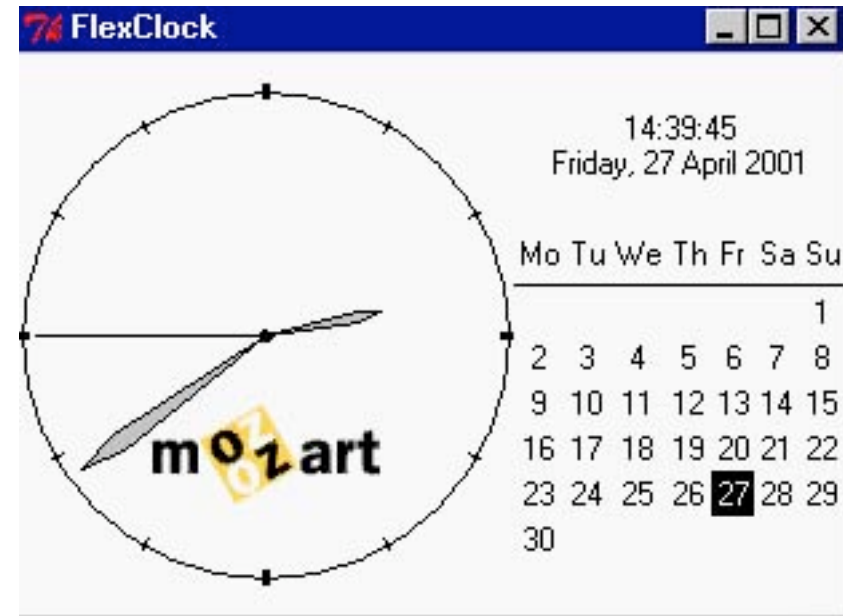
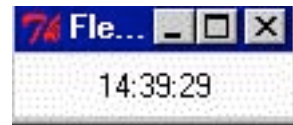


Samsung



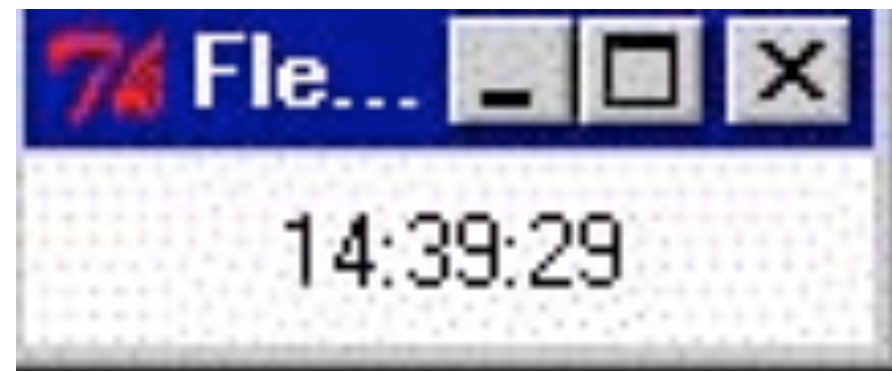
See Rekimoto

- Exercice 3: FlexClock [Grolaux 01]

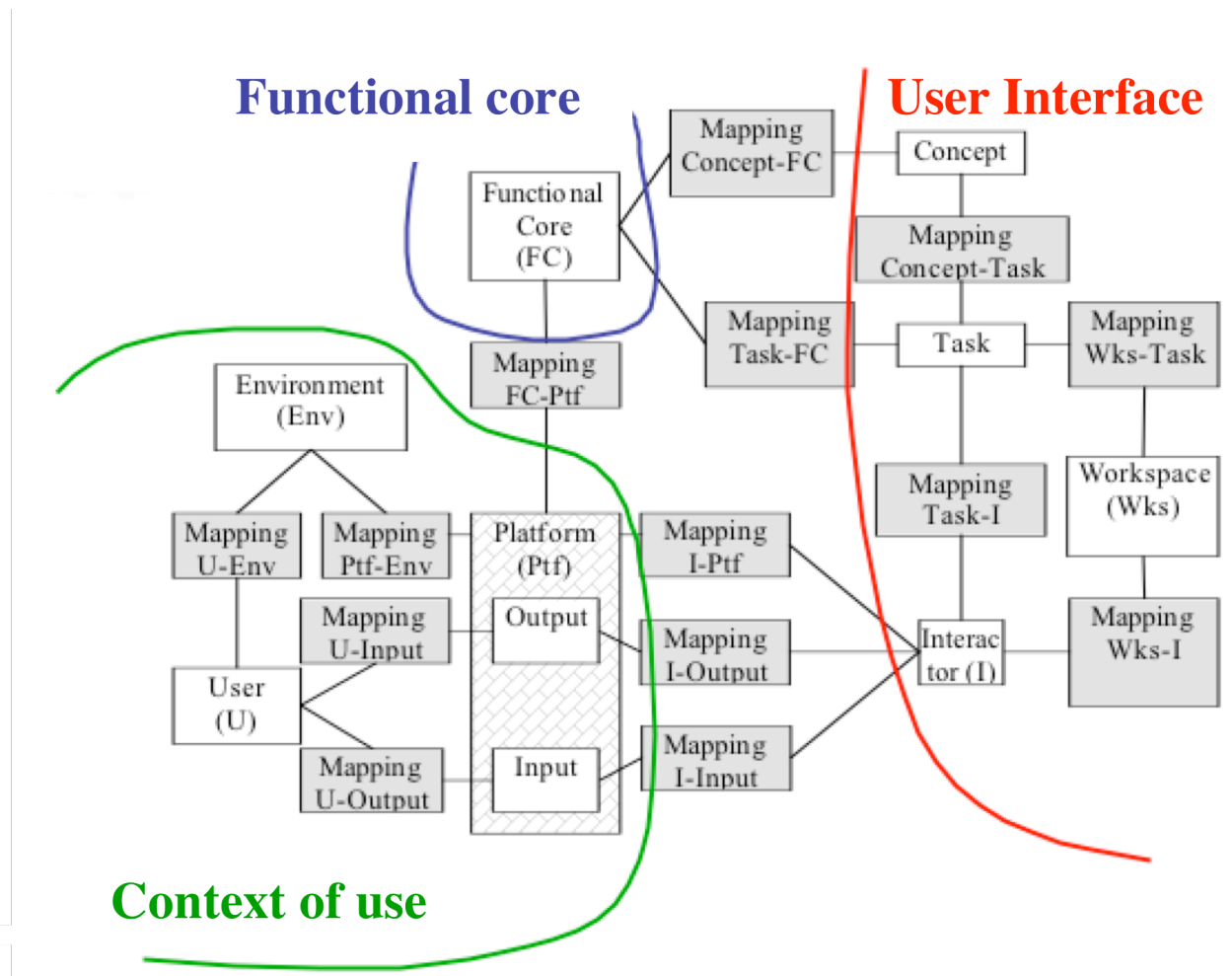


- Models

- Context of use
- Adaptation (driving value?)
- UI
- Beautification & degradation rules?



■ Towards a mapping model ...



- Context of use -

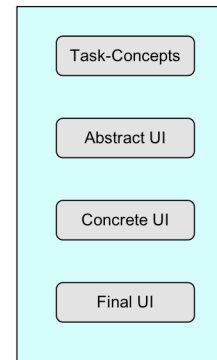
- User
- Platform
- Environment

- Adaptation -

- Evolution
- Transition

- Quality in use -

- Criteria
- Metrics

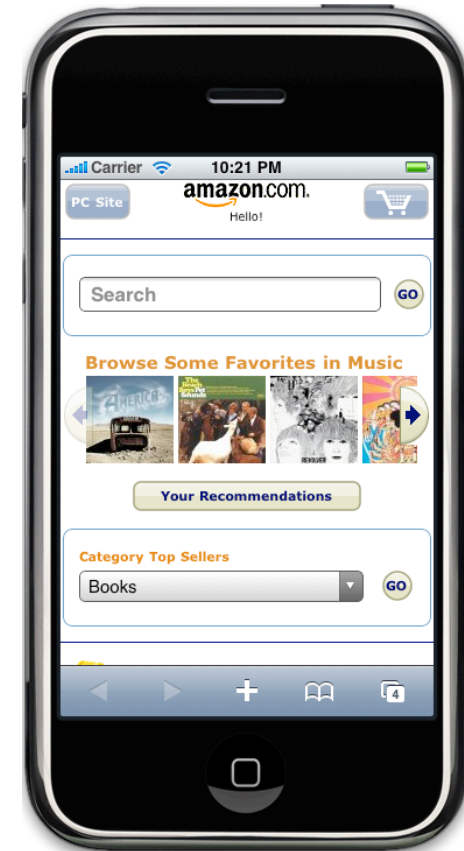




Models

■ Exercice 4: Discrepancies between desktop and mobile versions

The screenshot shows the Amazon.com desktop interface. At the top, there's a navigation bar with the Amazon logo, a personalized greeting for 'MR FRANCONE JEREMIE', and links for 'Today's Deals', 'Gifts & Wish Lists', and 'Gift Cards'. A search bar is prominently displayed. Below the search bar, there are several promotional banners and product listings. One banner asks 'Achetez-vous depuis la France?' (Do you buy from France?) with a link to 'Essayez amazon.fr'. Another section titled 'What Other Customers Are Looking At Right Now' features books like 'Don't Mind If I Do' and 'Everybody Kills Somebody Sometime'. There are also sections for 'Elegant Earrings Under \$100' and 'The Perfect Proposal Begins with the Perfect Ring'. A sidebar on the left lists various product categories like 'Books', 'Movies, Music & Games', etc. At the bottom left, there's a 'Features & Services' section with links like 'Selling with Amazon' and 'Publish on Kindle'.



■ Exercice 5: Discrepancies between desktop and mobile versions

Infoclimat - Météo en temps réel - observations prévisions climatologie forum

http://www.infoclimat.fr/accueil/

Mercredi 05 novembre 2008 21h42 CET - 20h42 UTC

Météo en temps réel

Bienvenue sur Infoclimat, la météo en temps réel

Episode pluvieux intense et durable dans le Sud-Est, consultez le bulletin spécial. Dernier mise à jour aujourd'hui à 19h15

Situation en temps réel

MétéoAlerte : [carte] [Alpes] [Béniouss] [idf] [NO] [NE] [SO] [MC] [SE] [détails] | Sat_IR | Foudre

05/11/2008 21:40

21h-20h 19h 18h 17h 16h 15h 14h 13h 12h 11h 10h

http://météoalerte.com/france/ http://infoclimat.fr/

Trade non-commercial / Non-commercial use only

DEFIESTERRE

Bulletin Quotidien de Suivi

05/11/2008
LA PLUIE Toujours DES NUAGES encore...La goutte froide "ségoutte" sévit. Le Grau-du-Roi -Gaugac (30) Agde -Istre ... par JJK92, adhérent Infoclimat

Lire le suite...

Infos-site

05/11 - Stations Infoclimat : La station de Forêt Dominiale de Saint-Michel (02) rejoint le réseau des stations

Plus d'informations...

Prévisions audio

mardi 4 novembre 2008

Bulletin enregistré Mercredi 5 Novembre à 00h ... prochaine actualisation Vendredi !

Ouvrir en lecture séparée...

Actualités

Fortes pluies sur le bassin méditerranéen - 24/10/2008
Alors que la Corse est toujours placée en vigilance orange par Météo-France en raison des fortes précipitations qui s'abattent depuis 2 jours, les autres pays du bassin méditerranéen ont également ...

Lire le suite...

Cela s'est passé un 5 novembre

(- réduire) **Températures maximales**

Marseille-Marcignane (13)	05/11/24	25.2°C
---------------------------	----------	--------

(+ développer) **Cumule de précipitations en 24 heures**

(+ développer) **Rafales de vent**

Records d'hier

T min	1.6°C	La Bédouze
T max minimale	10.3°C	Saint-Etienne-du-Bois
T max	19.6°C	Marseille - Dromed
T min maximale	14.3°C	Toulon - Le Basou
Vent	75.6km/h	Orcières - Les Marches
Précip	7.8mm	Le Grau-du-Roi

http://mobile.infoclimat.fr/

http://mobile.infoclimat.fr/

Google Google Scholar MCS IIHM UFRIMA

mobile.NFOCLIMAT.fr

Bienvenue sur Infoclimat - mobile !

Que souhaitez-vous faire?

- [M'informer sur les conditions météo](#)
- [Participer en temps réel](#)
- [Discuter sur le chat](#)
- [Lire le forum bas débit](#)



Models

- Exercise 6: Small is beautiful?
 - Elicit examples of degradation rules at each level of abstraction