Abstracts

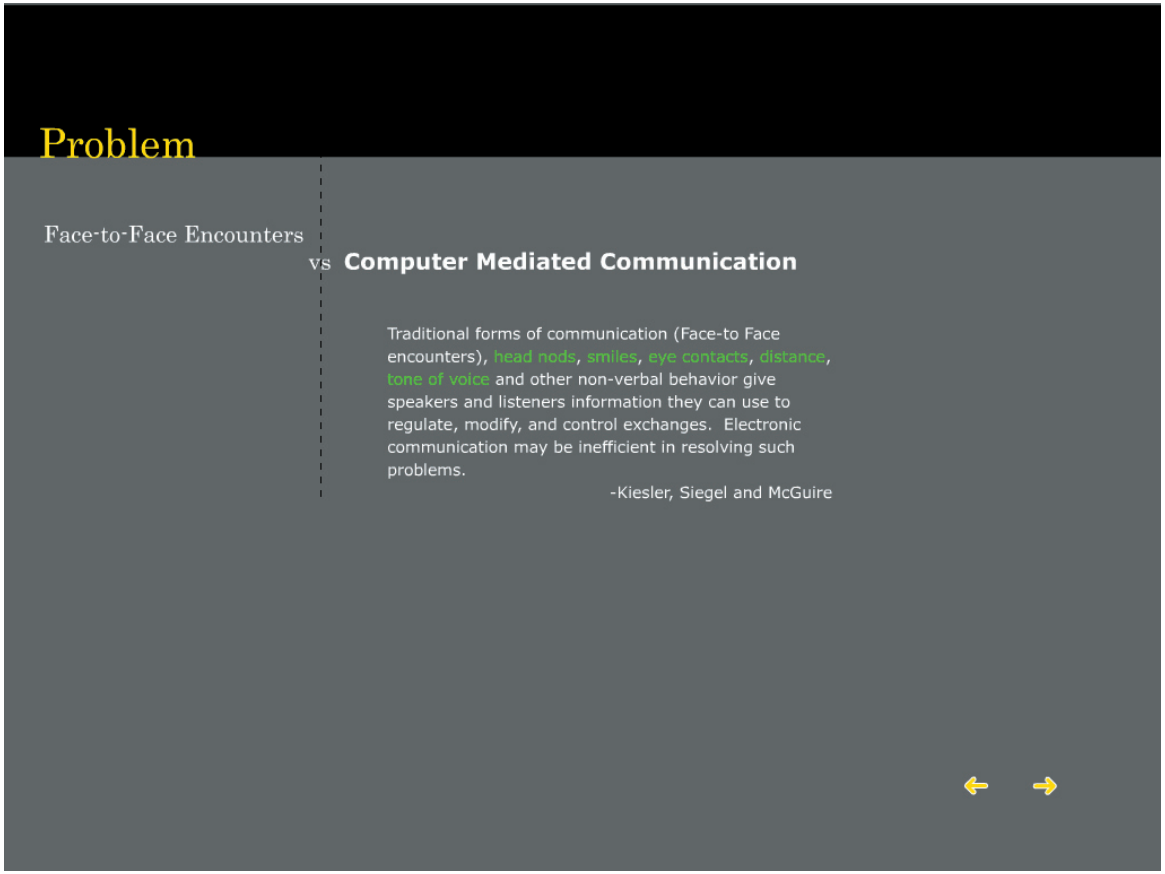
Instant messaging (IM) has been widely used as a medium for many aspects of social communication. Recently, companies have started applying the technology to allow better collaboration in the workspace and to explore new business opportunities. Although IM allows people to interact with others almost instantly without complete interruption to their on-going activities, the messages can be very distracting when IM becomes a major communication channel.

IM interaction is very limited in communicating non-verbal cues compared to Face-to-Face encounters. For example, if someone is trying to avoid a conversation with someone at the office, he may put on his headphones without music on or avoid eye contact with that person when he walks by him. Current IM systems features are very limited in supporting user with a need to express or make a decision on whether it is appropriate to have a conversation with another user. An opportunity exists to support IM users to express availability, current context of use, and current emotional state to increase the negotiation of availability for IM messaging. I have iteratively designed and tested an IM prototype that allows people to communicate in more natural ways.

Problem

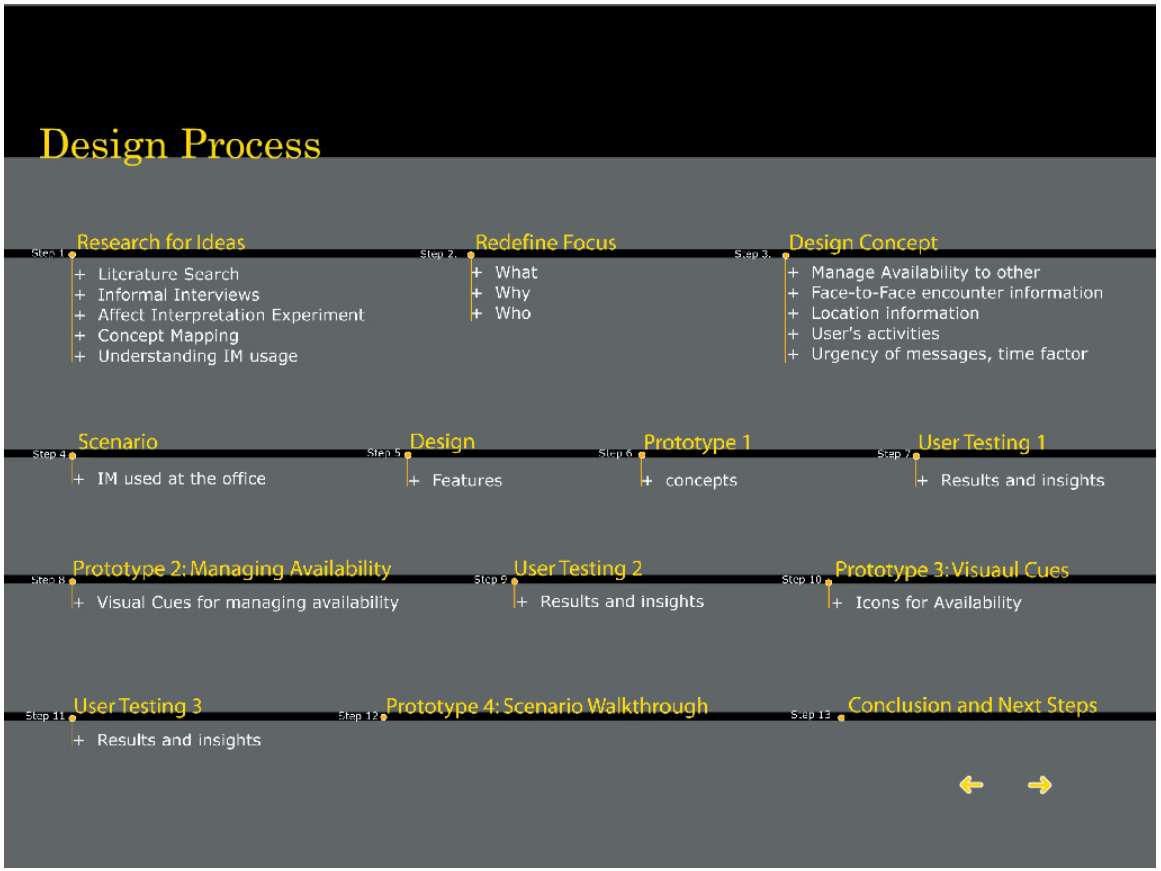
+ I found face to face conversation and IM have very similar characteristics(brief and opportunistics). Yet, IM lacks of non-verbal cues expression which plays a major role in human to human communications.

Presentation slide 2



Design Process

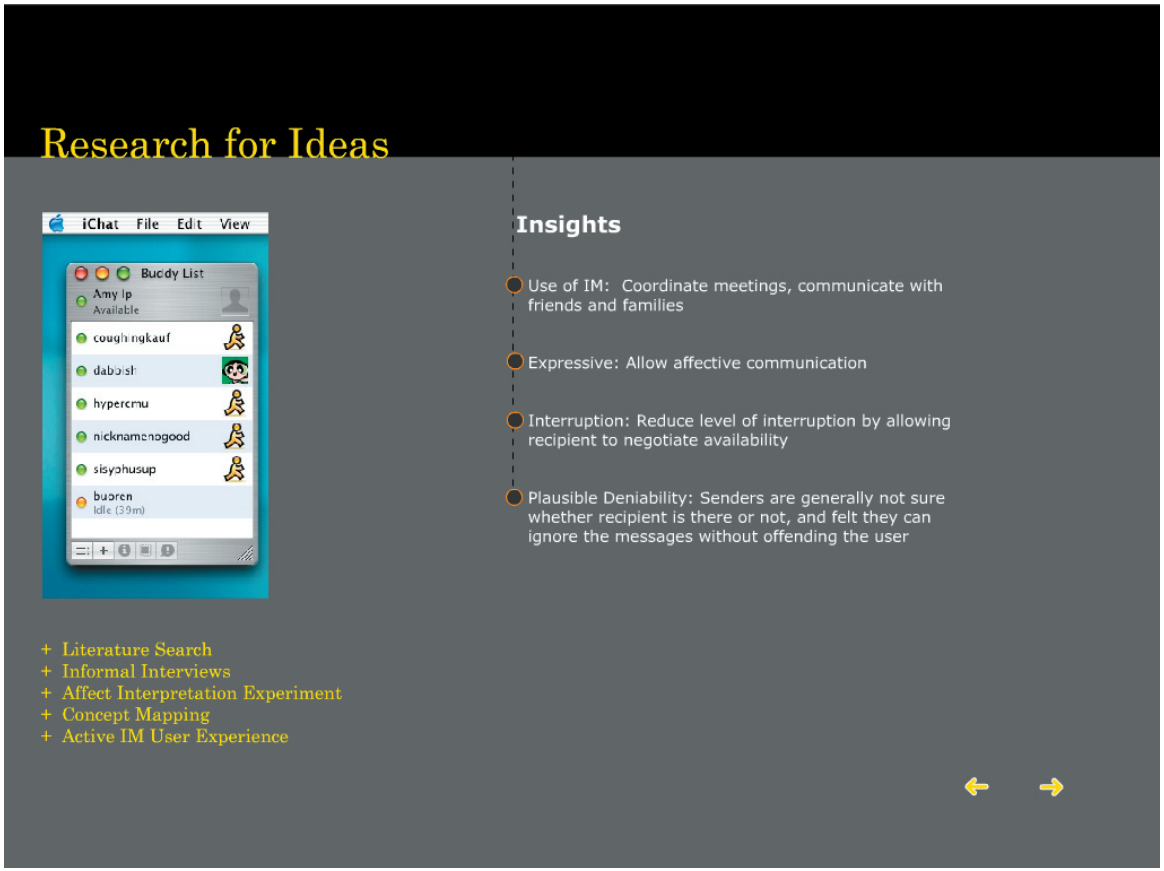
Presentation slide 3



+ **Instant messenger** has become an important communication channel to my student life here.
+ Since I come back to CMU, I have been using IM to communicate with my friends around the world.
+ Although I enjoy these applications very much, very often I feel frustrated because of their limitations.

Research for Ideas

Presentation slide 4



+ My research for brainstorming ideas includes conducting informal interviews on how people use IM, literature search on past research area related to the problem and concept map to help me understand the interatction problem.

+ I have conducted a literature search in area including IM commuincation, presence awrareness, social networks, collaboration, context awareness, interruption, SMS and emoticons.

+ Among different design issues in IM, I was particularly interested in presence awareness and emotional expression.

+ Literature Search

- + IM Communication
- + Presence Awareness
- + Collaboration
- + Interruption
- + Social Network

Key References:

1. Bonnie A. Nardi, Steve Whittaker. *Interaction and Outeraction: Instant Messaging in Action.*

2. Mary Czerwinski, Edward Cutrell and Eric Horvitz. *Instant Messaging and Interruption: Influence of Task Type on Performance.*

3. Ellen Isaacs, Alan Walendowski, Dipti Ranganathan. *Hubbub: A sound-enhanced mobile instant messenger that supports awareness and opportunistic interactions.*

4. James D. Herbsleb, Audris Mockus, Thomas A. Finholt, Rebecca E. Grinter. *Distance, dependencies, and delay in a global collaboration.*

5. J.B. Walther, K.P. D'Addario. *The Impacts of Emoticons on Message Interpretation in Computer-Mediated Communication.*

6. Brittney G. Chenault. *Developing Personal and Emotional Relationships Via Computer-Mediated Communication.*

7. Alecia Wolf. *Emotional Expression Online: Gender Differences in Emoticon.*

8. Andrea Lyn Lockerd. *Understanding Implicit Social Context in Electronic Communication.*

Quotes :

"IM interactions share many of the characteristics of informal face to face communication, being opportunistic, brief, context-rich and dyadic." (1)

"Many of the social cues that allow people to naturally function with their social network in the above scenario are not inherent or obvious in CMC, which therefore obfuscates the maintenance and utilization of ones' social network online." (9)

"This gives rise to a fundamental asymmetry in conversation: the time and topic are convenient for the initiator, but not necessarily the recipient." (1)

"We found that people found value in simply knowing who else was "around" as they checked the buddy list, without necessarily wanting to interact with buddies." (1)

The first of these findings is consistent with the notion of chunking behaviors (Sellen, Kurtenbach, & Buxton, 1990), suggesting that some behaviors are grouped tightly into chunks and thus are difficult to control or guide once their execution begins. (1)

(Refer to appendix A)

+ Informal Interviews

I have talked to many of my friends, designers and faculties here at CMU and gather their insights about Instant Messaging. At several ocassions, I have initiated discussion with small groups of 3 -5 people about their experience in using IM.

Quotes :

“IM is intrusive.”

"I use it for informal conversation with my boss."

"I onlyuse it when I am bored."

"I felt obligated to answer people's message."

"It is very distracting."

"I use it to communicate with my friends on the day of 9/11."

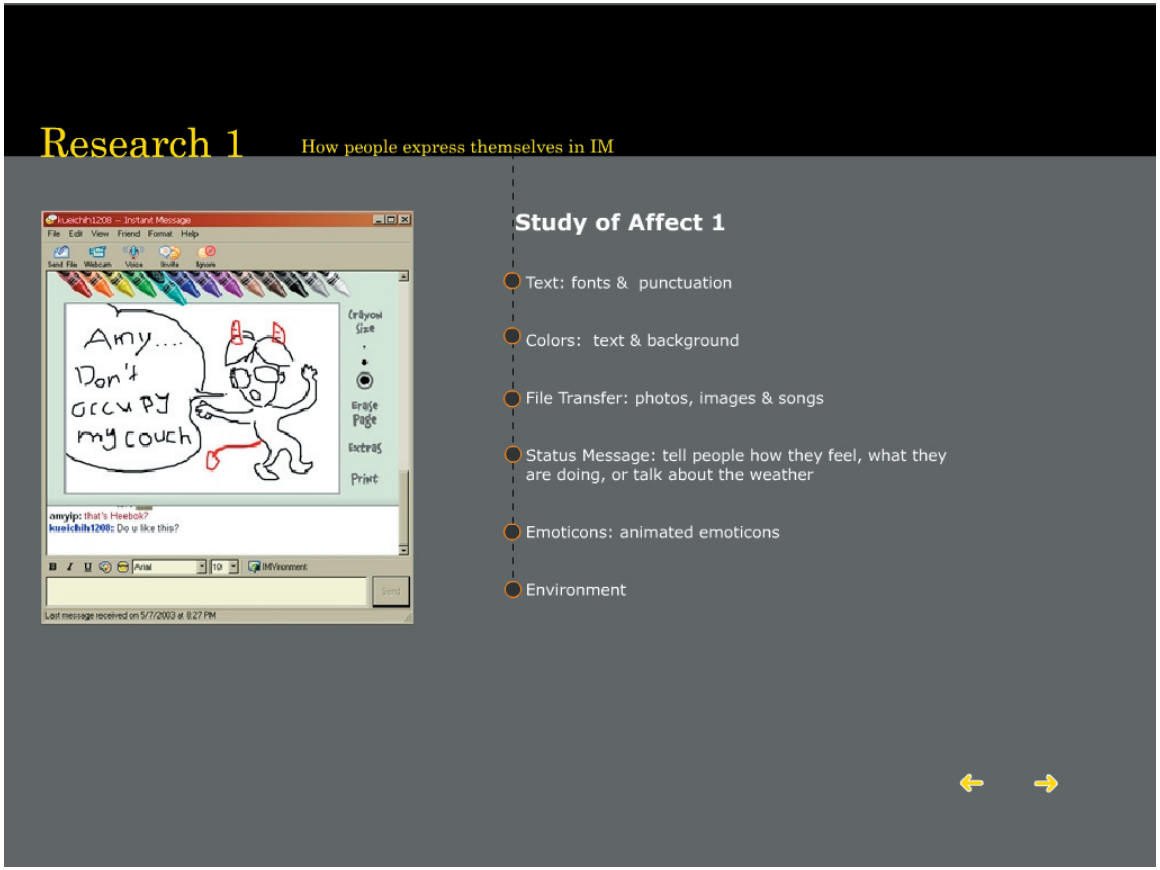
" Isn't it up to the user whether they want to repond or not?"

" I use it to talk to my friends when I am bored."

+ People use different media and method to communicate with others.

+ Text, color, animation, emoticons, photos, images, sound, songs, status messages were used to express their emotions.

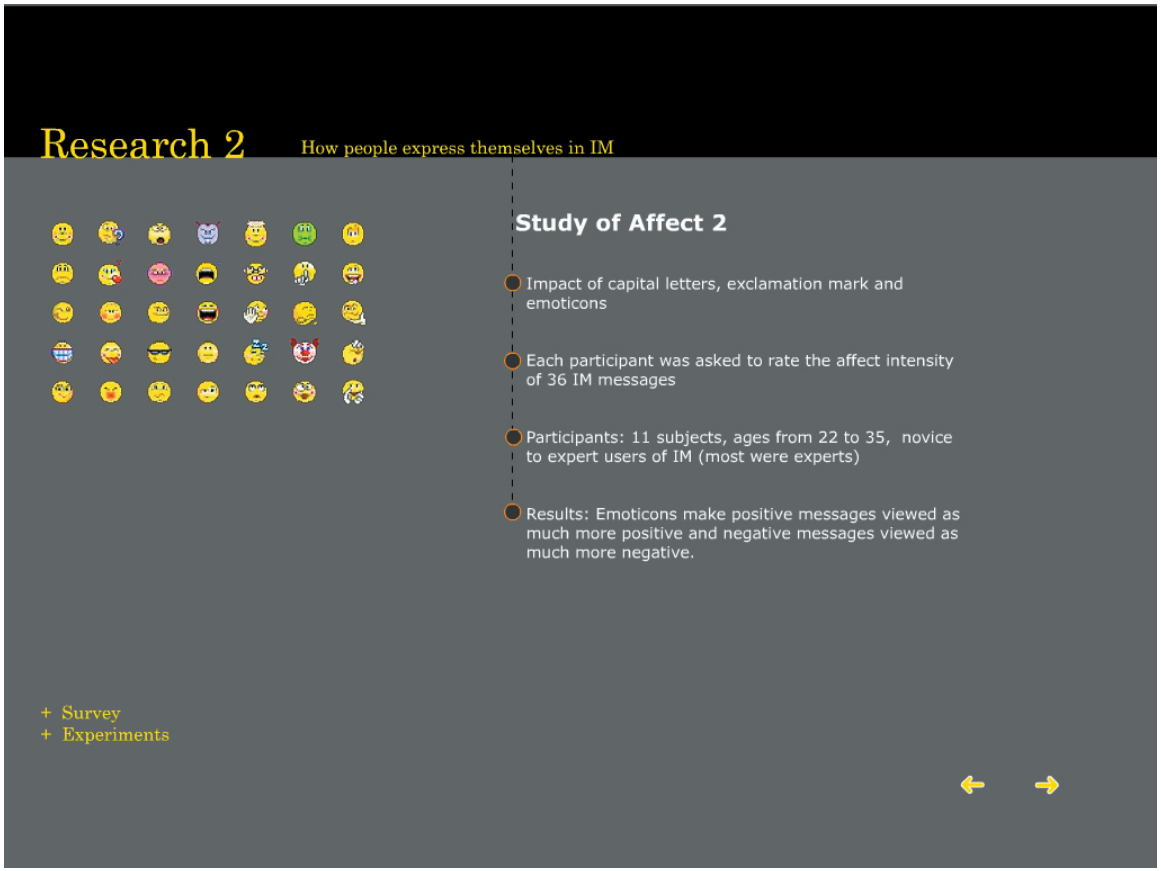
Presentation slide 5



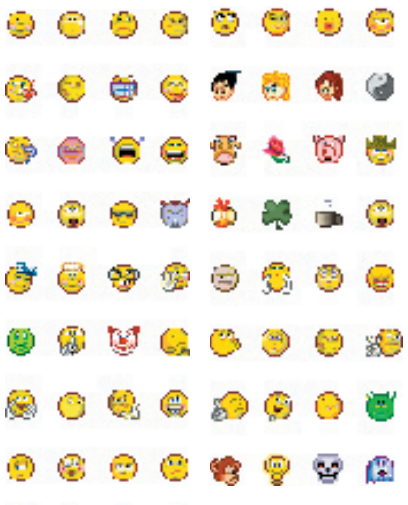
Research for Ideas

+ Conducted an experiment on how people interpret IM messages with different emoticons and punctuation.

Presentation slide 6



+ Experiment



Emoticons have been used for many years to increase the richness of messages in informal email and chat sessions. They are also becoming part of the culture of Instant Messaging (IM) communications. I was interested in understanding how people use emoticons and their effectiveness in the fast and short exchanges characteristic of IM.

I have conducted an experiment on how emoticons influence receivers' interpretation of the affect intensity of instant messages. I found that a happy (smiling) emoticon increased the positivity of a positive IM message more than a negative (frowning) emoticon increased the negativity of a negative IM message.

Insights

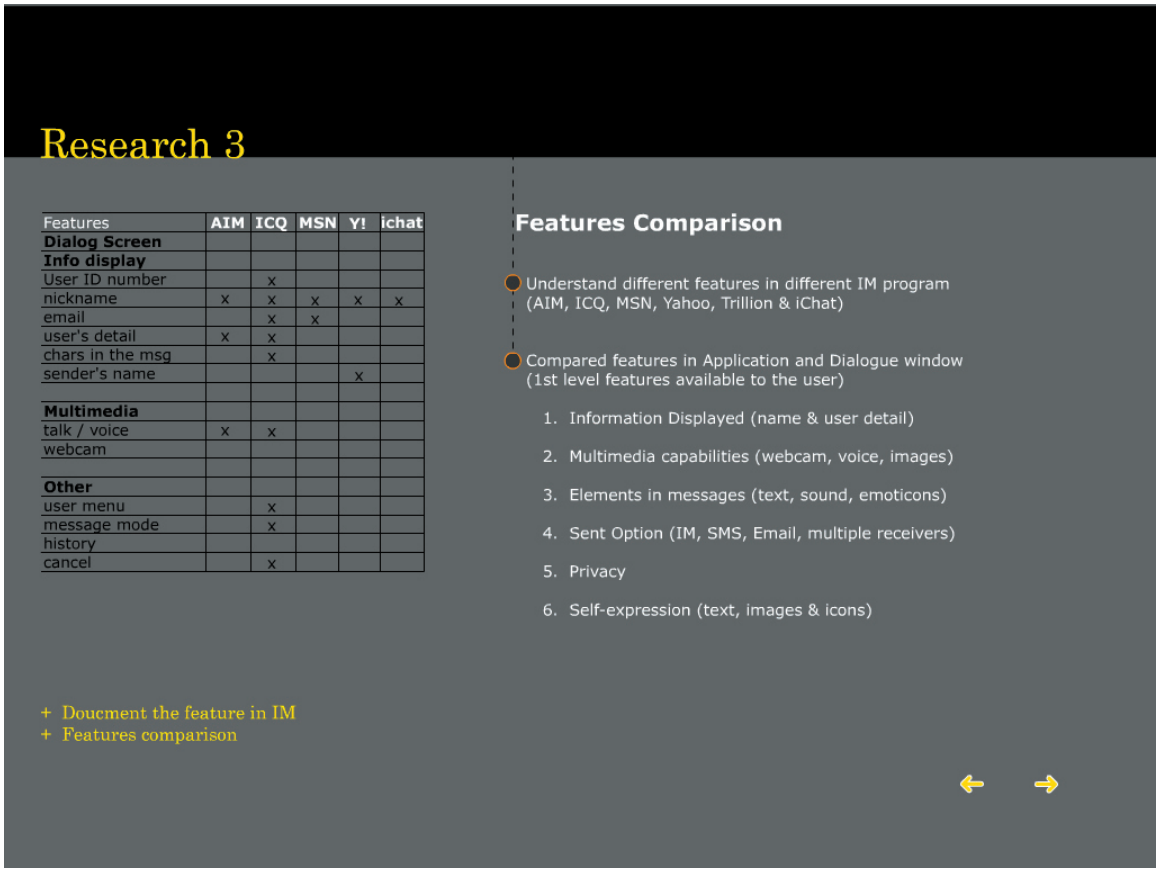
Wolf in her paper, *Emotional Expression Online: Gender Differences in Emoticon,* suggests that as emoticons become more elaborate and as more choices are available, people will use more variations of emoticons. If the prediction is correct, senders and receivers will need to agree on what messages mean emotionally in order to reach common ground. Common standard for emoticons and punctuation in IM, or at least to some agreement on whether such a standard would be useful.

(Refer to appendix B)

+ Compared the at-a-glance features available to users in different IM programs.

  (AIM, ICQ, MSN, Yahoo & iChat)

Presentation slide 7



Research 3

Features	AIM	ICQ	MSN	Y!	ichat
Dialog Screen					
Info display					
User ID number		x			
nickname	x	x	x	x	x
email		x	x		
user's detail	x	x			
chars in the msg		x			
sender's name				x	
Multimedia					
talk / voice	x	x			
webcam					
Other					
user menu		x			
message mode		x			
history					
cancel		x			

+ Doucment the feature in IM
+ Features comparison

Features Comparison

- Understand different features in different IM program (AIM, ICQ, MSN, Yahoo, Trillion & iChat)
- Compared features in Application and Dialogue window (1st level features available to the user)
  1. Information Displayed (name & user detail)
  2. Multimedia capabilities (webcam, voice, images)
  3. Elements in messages (text, sound, emoticons)
  4. Sent Option (IM, SMS, Email, multiple receivers)
  5. Privacy
  6. Self-expression (text, images & icons)

+ Explore the UI design of different features. It inculdes the information architecture, layout of features, use of graphical cues and icons.

Presentation slide 8

Research 4

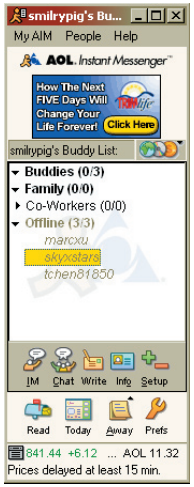
User Interface Comparison

- Where the features are located
- How graphical elements are used for different features
- How users modify settings

+ Active IM User

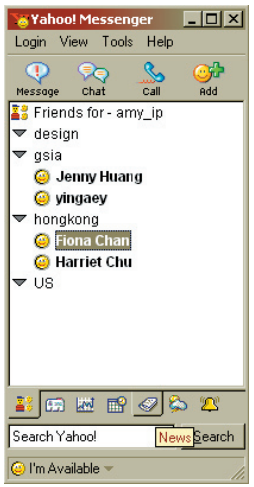
I became an active user for all major IM programs.

+ AIM

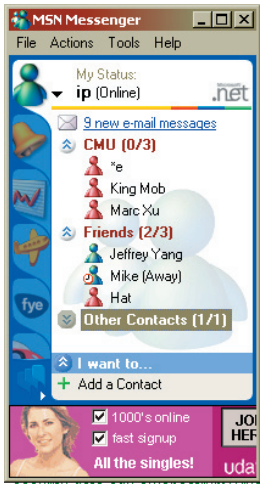


+ ICQ

+ Yahoo

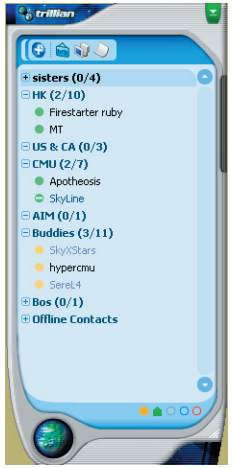


+ MSN



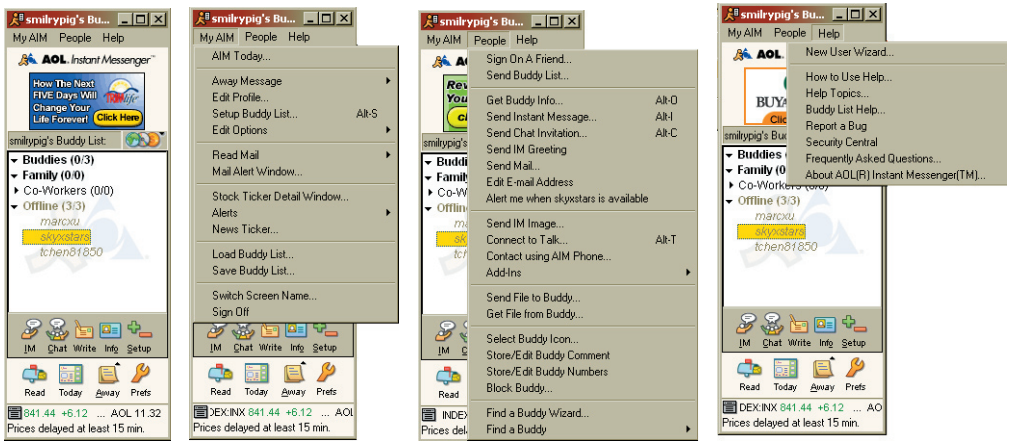
+ iChat

+Trillion

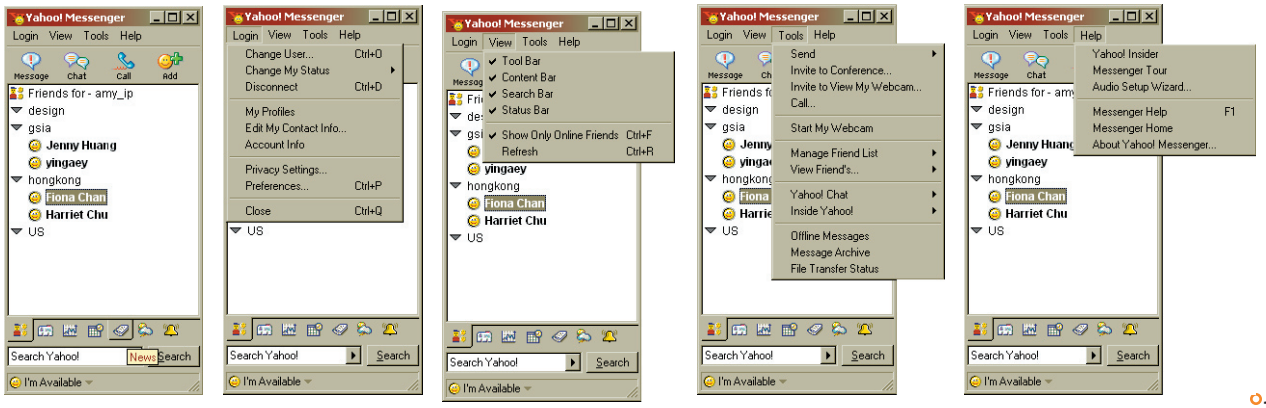


+ Understanding the features in IM programs 1

+ AIM

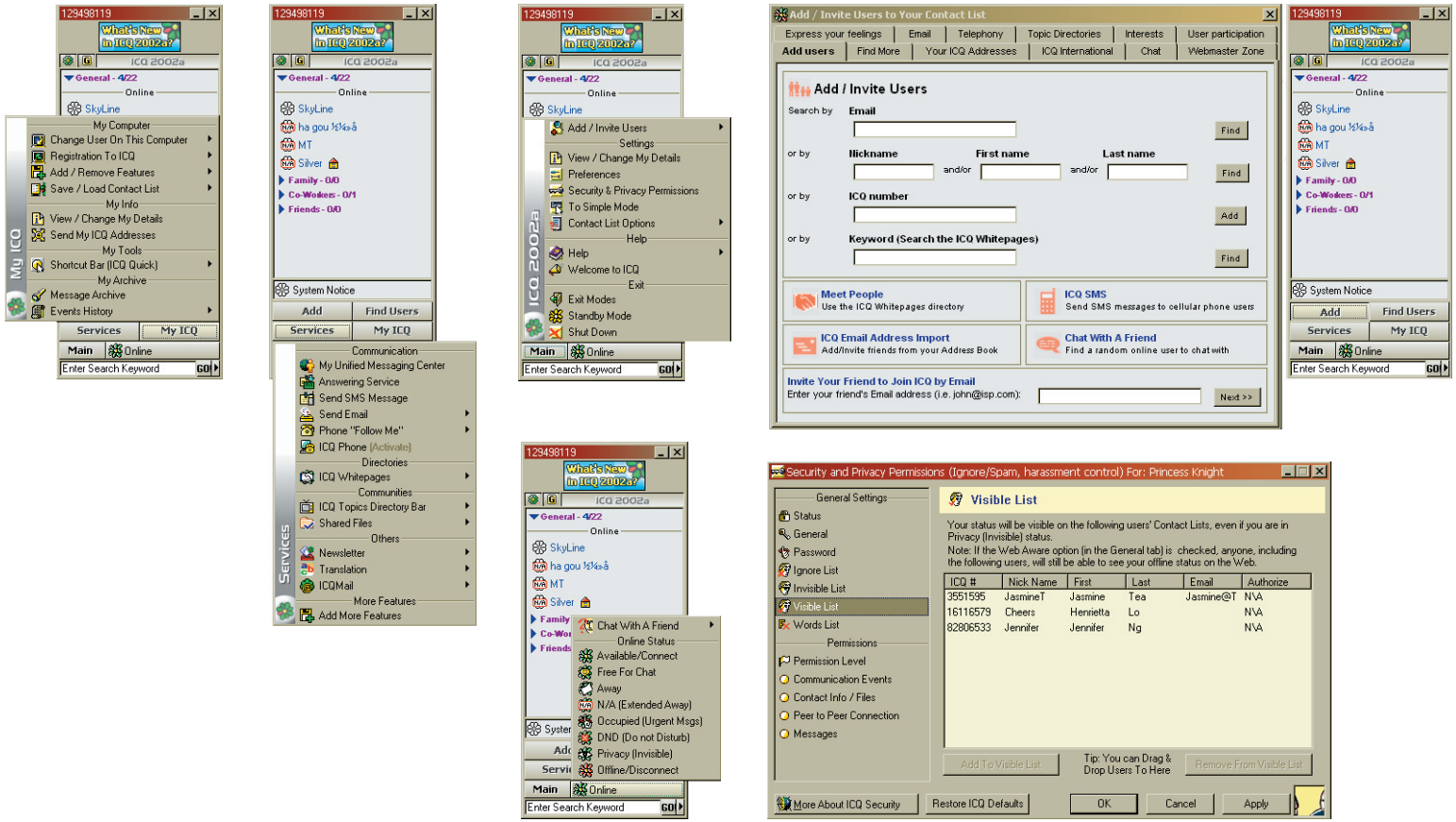


+ Yahoo



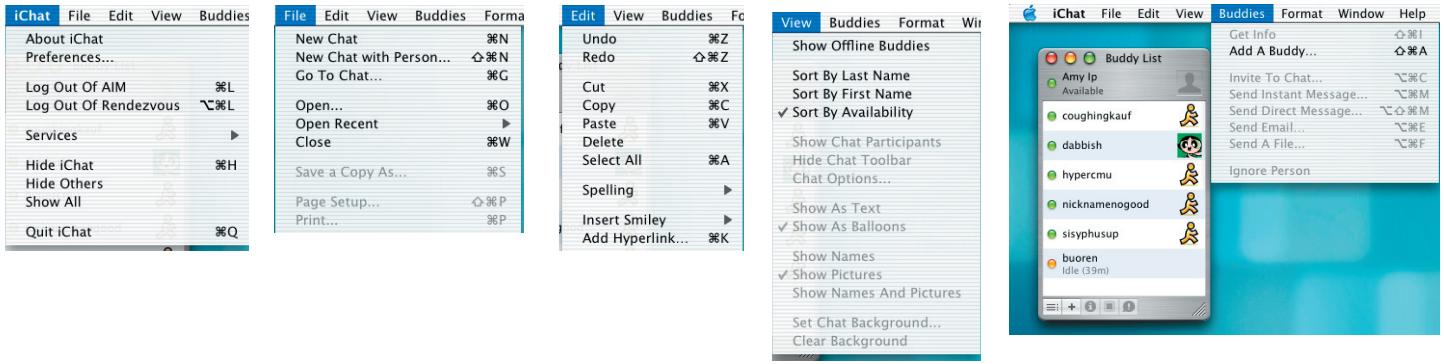
+ Understanding the features in IM programs 2

+ ICQ



+ Understanding the features in IM programs 3

+ iChat



+ MSN

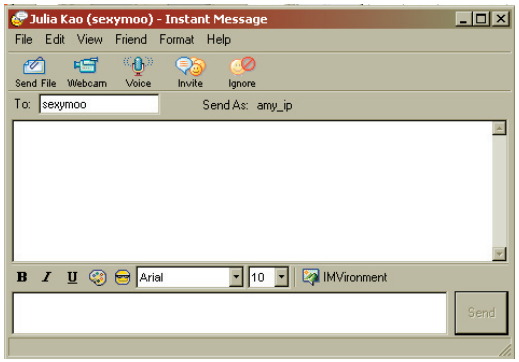
+ Comparing Features of different IM 1

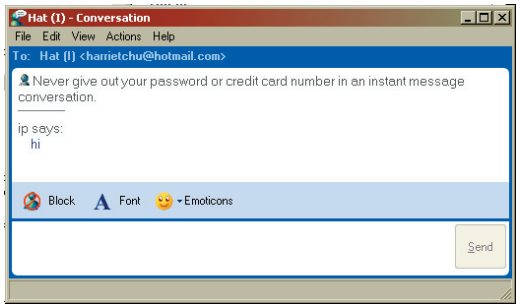
Features	AIM	ICQ	MSN	Yahoo	
Dialog Screen					
Info display					
User ID number		x			
nickname	x	x	x	x	x
email		x	x		
user's detail	x	x			
chars in the msg		x			
sender's name				X	
Multimedia					
talk / voice	x	x			
webcam					
Other					
user menu		x			
message mode		x			
history					
cancel		x			
Message Option					
text -font		x		x	
text -Bold	x			x	x
text -Italic	x			x	x
text -size	smaller/ bigger			x	
text -Underline	x			x	
text color	x	x		x	
text button - open window to customize		x	x		
IM environement / bk images				x	???
background color	x	x			
sound on off		x			
spell check		x			
Emoticons with text		x			
Emoticon	x	x	x	x	x
link	x				

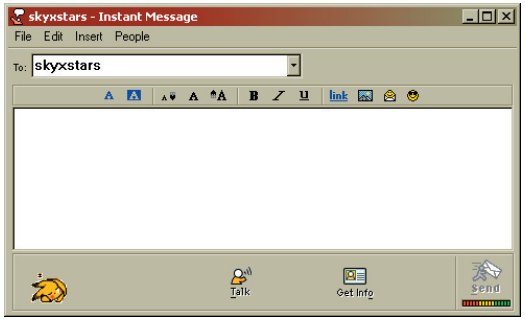
Features	AIM	ICQ	MSN	Yahoo	iChat
Sent Option					
send by IM		x		x	
send by sms		x			
email		x			
select multiple sender		x			
attachment	images				x
Conference / Privacy					
Invite				x	
Ignore/block			x	x	
warning	x				
self-expression					
text	away msg	away msg	name id	status msg	
images / icon	x				
Features	AIM	ICQ	MSN	Yahoo	
Application Screen					
status	x	x	preset	x	
grouping	x	x	x	x	
away / auto respond	x	x		x	
Add contact / setup	x	x	x	x	
chat					
info					
call					
create IM msg			double click	x	

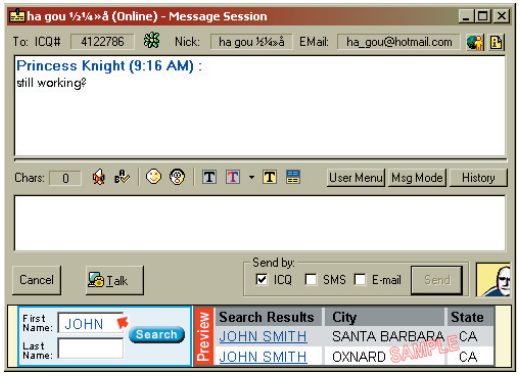
+ Since there were alot of features in the IM Programs, I wasn't able to comparisons all the features among the programs. Therefore, I decided to focus on the information architecture of the at-a-glance features that are available to the users.

+ Comparing Features of different IM 2









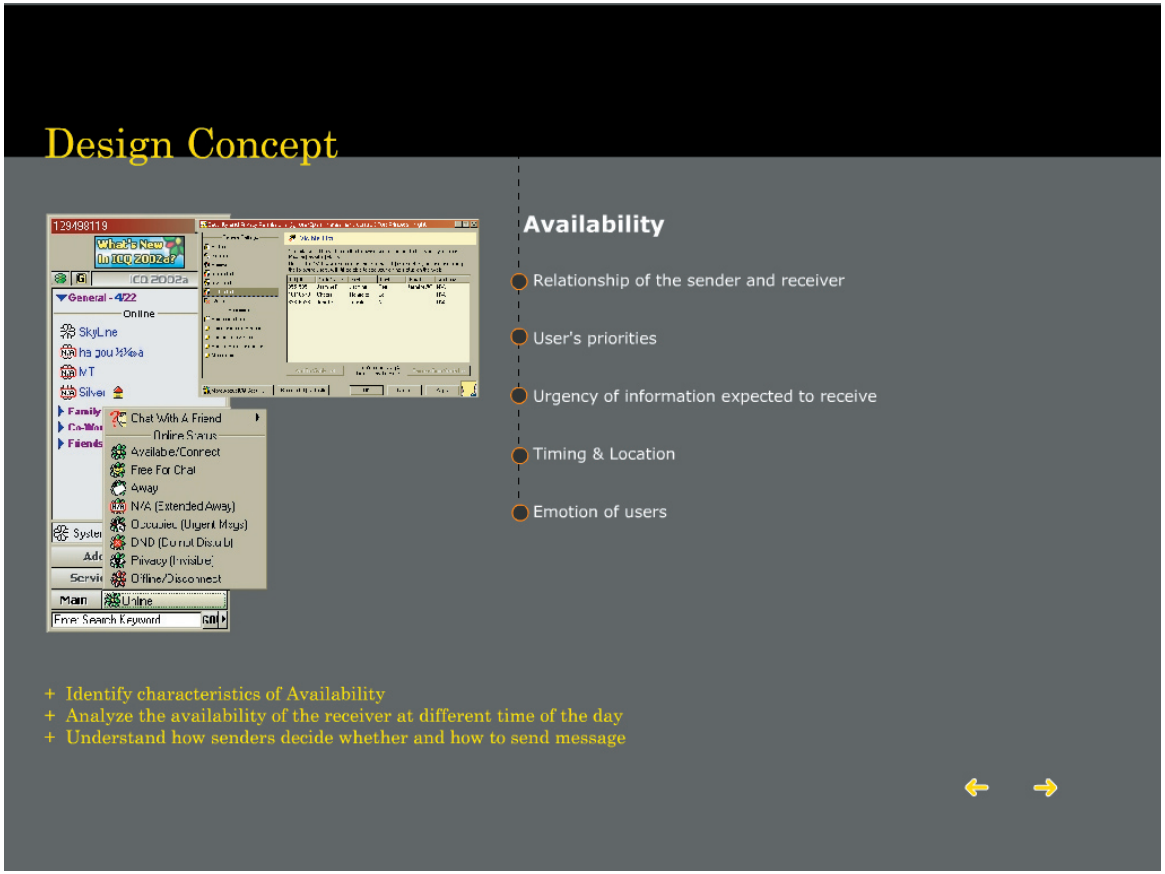
Redefine Focus

+ After understanding the big picture of the problems, I need to focus and work towards the solution of a specific problem because of time constraints.

Presentation slide 9

Design Concept

Presentation slide 10



+ Although IM allows people to interact with others almost instantly without complete interruption to their on-going activities, the messages can be very distracting when IM becomes a major communication channel.
+ As people start using IM at work places, tools that can assist users to manage availability is nescessary.
+ In order to design features that support availability, I need to understand what juristics availability of someone to another person.

Scenario

+ In my design process, Persona is used.

+ Scenarios of use: How would someone may use IM for different types of communication (clients, co-workers, friends and families) at different times(morning, afternoon, late evening) with different moods (frustrated, focus on work, happy, bored).

Presentation slide 11

(Refer to appendix C)

Design

+ Design Specification:
  Design features to provide information that indicate availability.
+ Visual Exploration:
  Explore different visual representation of the information.
+ Create paper prototype for wire frame design.

Presentation slide 12

Design 1a

Information Type	Information	entry	Data Type/
entry	First Name	single	text
	Last Name	single	text
	Nickname	multiple	text & image
	Social relation -	multiple	text
	group person		category(friends / family / others)
Status	Availability		text
			category: **Online** **Available** **Task/Work** **Away** **Offline**
Task	what am I doing		text
	busyness		category : **Free to Chat** **Available** **Urgent Message Only** **Busy** **Invisible**

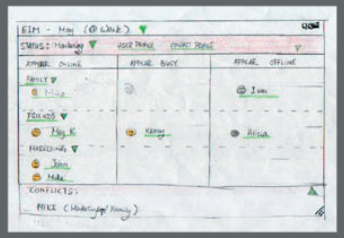
Design Idea & Sketches

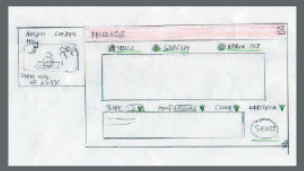
+ Identify features and data type
+ Sketching
+ Functional Design
+ Create Paper Prototype

+ In my design, availability is determined by: Priority, Context and Emotion.

Presentation slide 13

Design 1b

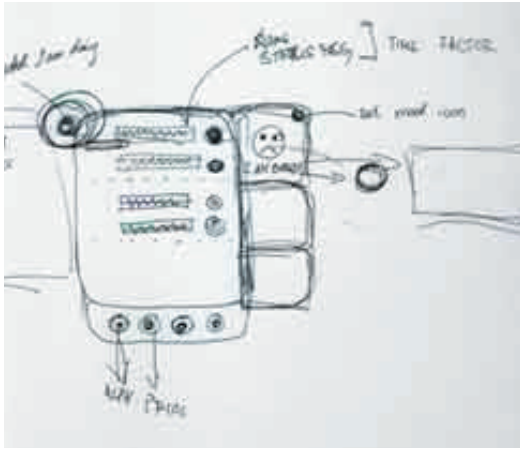


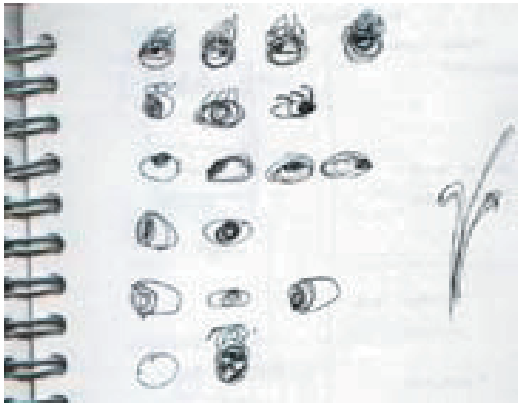


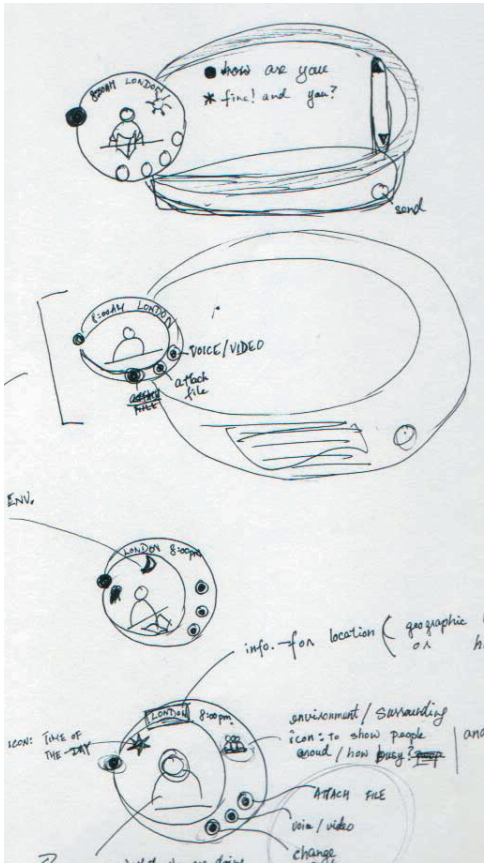
Key Features help provide information of user's availabilty

- Priority: People I am interested to talk
- Context: User's Task, Time and location information
- Emotion: Status message & icons to express emotions

Idea Sketches



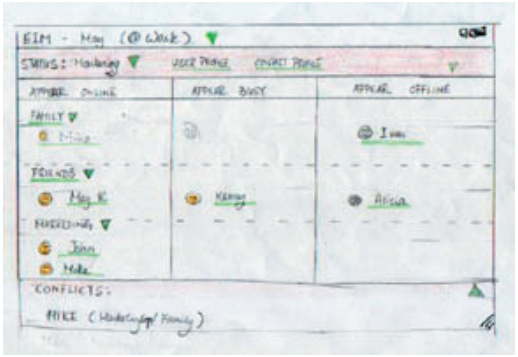


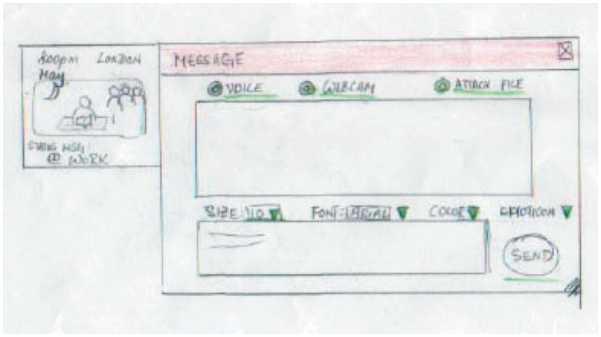


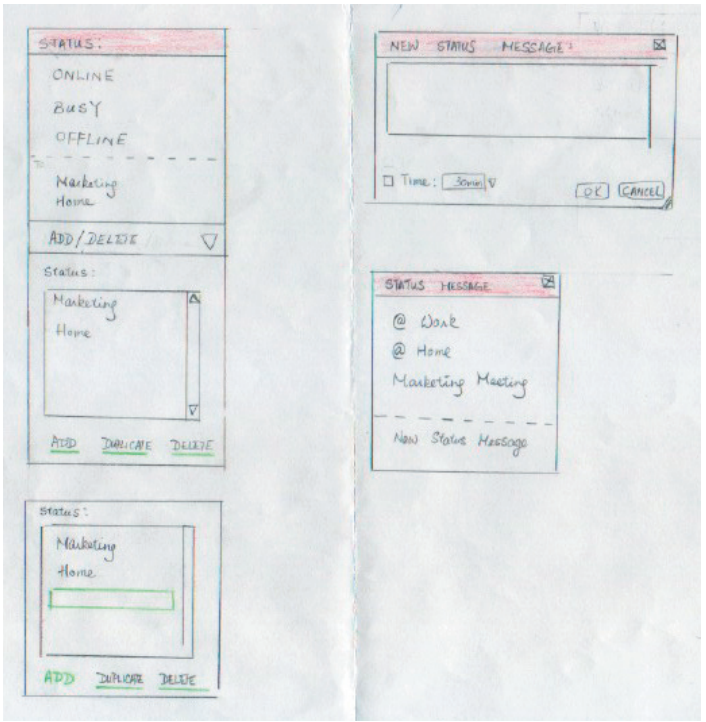
+ Availability is hard to be determined. In real world situation, it is mostly determined by the person by assesing different types of information.

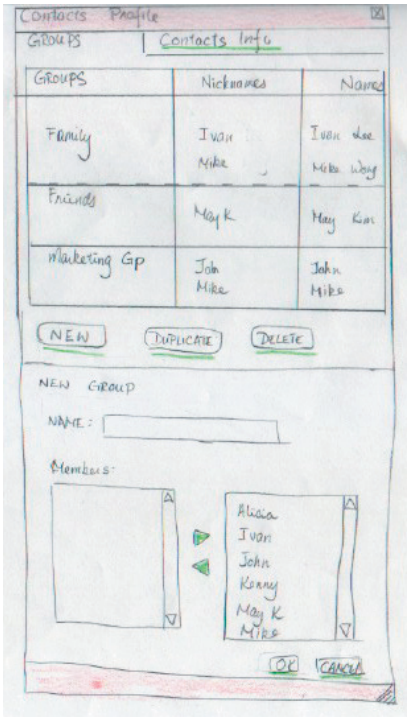
+ I am trying to provide information of the user's current task and physical environment to help defining availabity of that person.

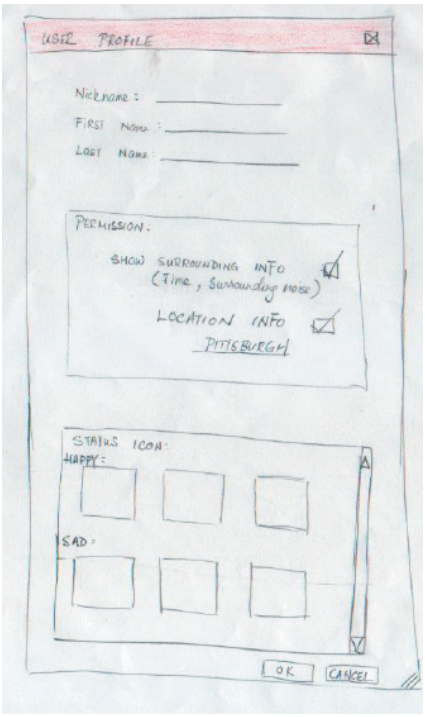
Design


IM - May (@ Work)
STATUS:
USER PROFILE
CONTACT PROFILE
APPEAR ONLINE
APPEAR BUSY
APPEAR OFFLINE
FAMILY
Mike
Ivan
FRIENDS
May K
Kenny
Alicia
John
Mike
CONFLICTS:
MIKE (Marketing/ Family)


MESSAGE
VOICE
WEBCAM
ATTACH FILE
SIZE
FONT
COLOR
EMOTICON
SEND


STATUS:
ONLINE
BUSY
OFFLINE
Marketing
Home
ADD/DELETE
Status:
Marketing
Home
ADD
DUPLICATE
DELETE
Status:
Marketing
Home
ADD
DUPLICATE
DELETE
NEW STATUS MESSAGE
Time:
OK
CANCEL
STATUS MESSAGE
@ Work
@ Home
Marketing Meeting
New Status Message


Contacts Profile
Groups
Contacts Info
GROUPS
Nicknames
Names
Family
Ivan
Mike
Friends
May K
Marketing GP
John
Mike
NEW
DUPLICATE
DELETE
NEW GROUP
NAME:
Members:
Alicia
Ivan
John
Kenny
May K
Mike
OK
CANCEL


USER PROFILE
Nickname:
FIRST Name:
LAST Name:
PERMISSION:
SHOW SURROUNDING INFO
(Time, Surrounding noise)
LOCATION INFO
PITTSBURGH
STATUS ICON:
HAPPY:
SAD:
OK
CANCEL

+ The availability features are determined by: Priority, Context and Emotion.

Information Type	Information	entry	Data Type/	data example	Research Reference	Attributes factors
Buddy Info entry	First Name	single	text	Sharon		user input
	Last Name	single	text	Lee		user input
	Nickname	multiple	text & image	orange		user input
	Social relation - group / organization / event	multiple	text	work / fitness club		previous history(for social network closeness) + user input
	Social relation - person		category(friends / family / others)	friends		user input
Status	Availability		text	working		computer input dvice
			category: **Online** **Available** **Task/Work** **Away** **Offline**			
Task	what am I doing		text	working		computer input dvice
	busyness		category : **Free to Chat** **Available** **Urgent Message Only** **Busy** **Invisible**	very busy		busy with other things

1st User Testing

Presentation slide 14

User Testing 1

+ Design questionaire for interview
+ Recruit volunteer participants
+ Conduct InterviewsA

Paper Prototyping

- Understanding how user manage social group in IM
- Gather opinions of the new features
- Participants: 6, medium to expert user, age 20-30
- Key Findings:
  - \+ Using availability to mange people on the list
  - – Interface is confusing
  - – Smaller screens preferred
  - \+ Surrounding environment information is useful
  - – Notation seems to cause confusion
  - – Some users concern people won't message them

Redesign 1

+ After analyzing the data from the first user testing, I have redesigned the interface. I have a few ideas of how the information can be represented, and decide to conduct user testing to see if other people may find those features useful.

Presentation slide 15

Design 2

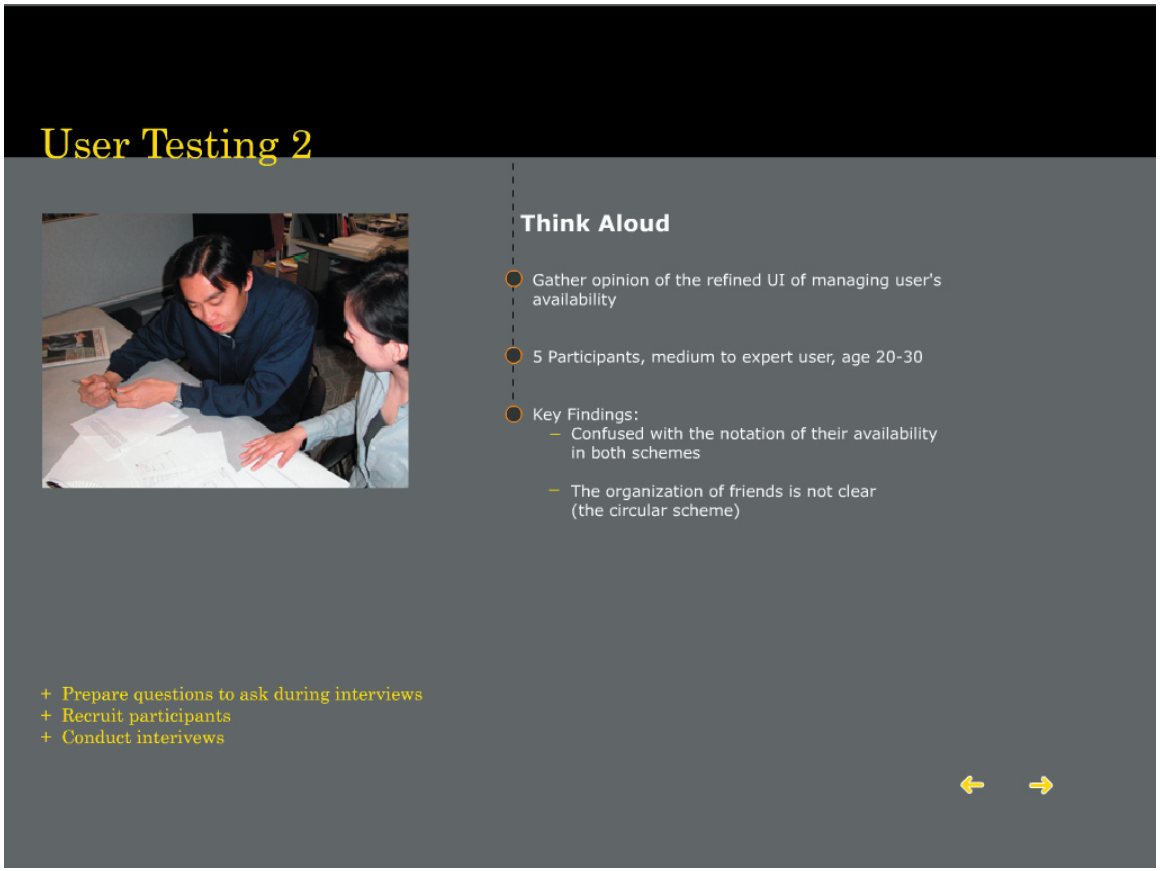
Managing Availability

- Design focus:
  1. How available I am to the others
  2. How available my friends are to me
- Redesign the layout
- Rename the categories of Availability
- Modify the visual notation of setting and user's status

+ Explored different visual representation
+ Use of space for information
+ Re-evaluatate the amount of information revealed to user at different task

2nd User Testing

Presentation slide 16



(Refer to appendix D)

Redesign 2

+ Refining the visual elements.

Presentation slide 17

Design 3

Hierarchical Design

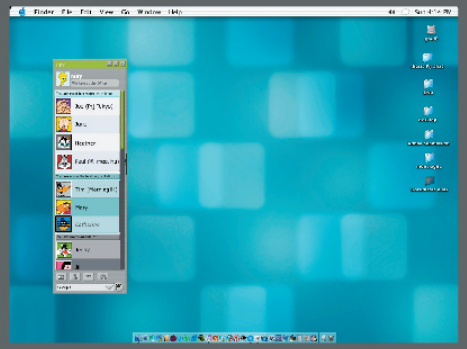
- Refine the Scheme 1 design - hierachical list
- Organization:
  1. Miminized View: Icons only
  2. Regular View: Icons with names
- Notation for Availability:
  1. Icon + status seperately
  2. Icons with status information

+ Redesign layout of the list design
+ Explore different representation of freind's availability

Final Prototype

Presentation slide 18

Digital Prototype



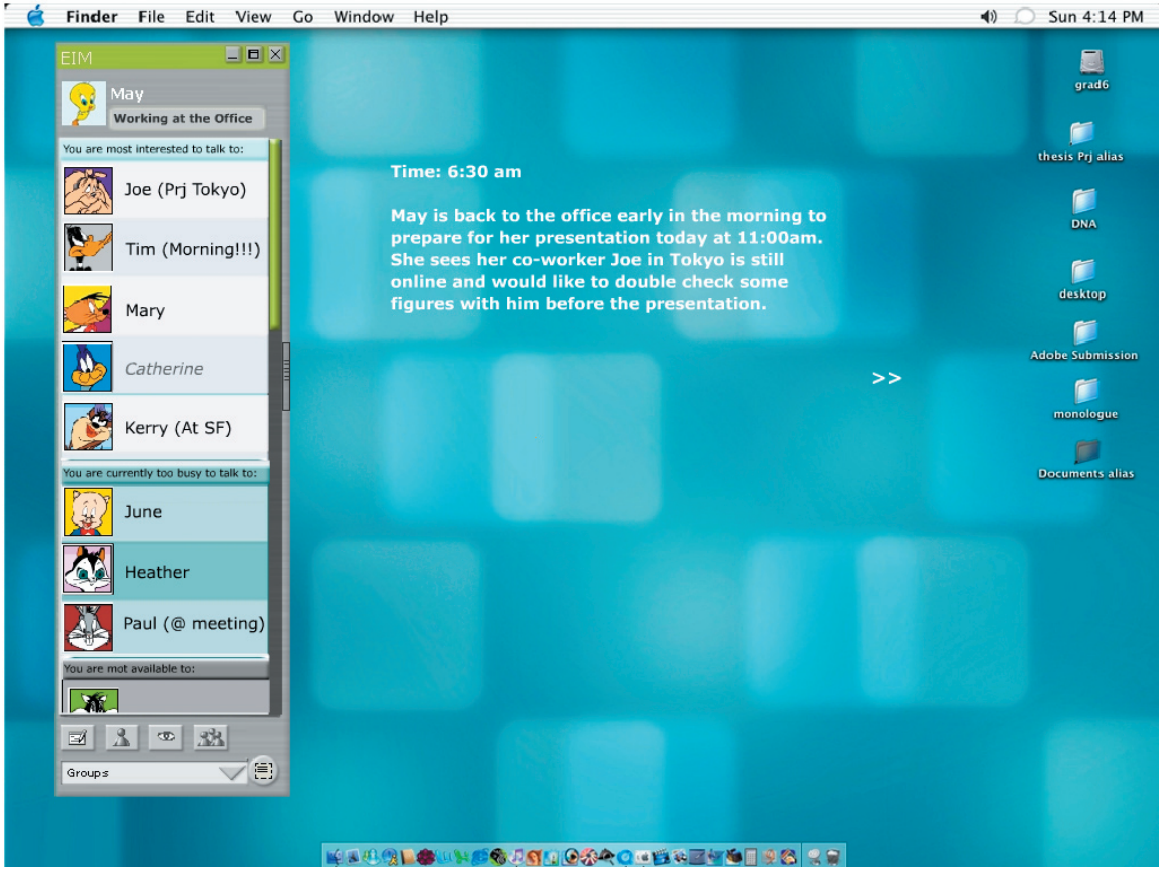
Scenario of Use

>> View Demo

Scenario Slides

6:30 am - Asking questions

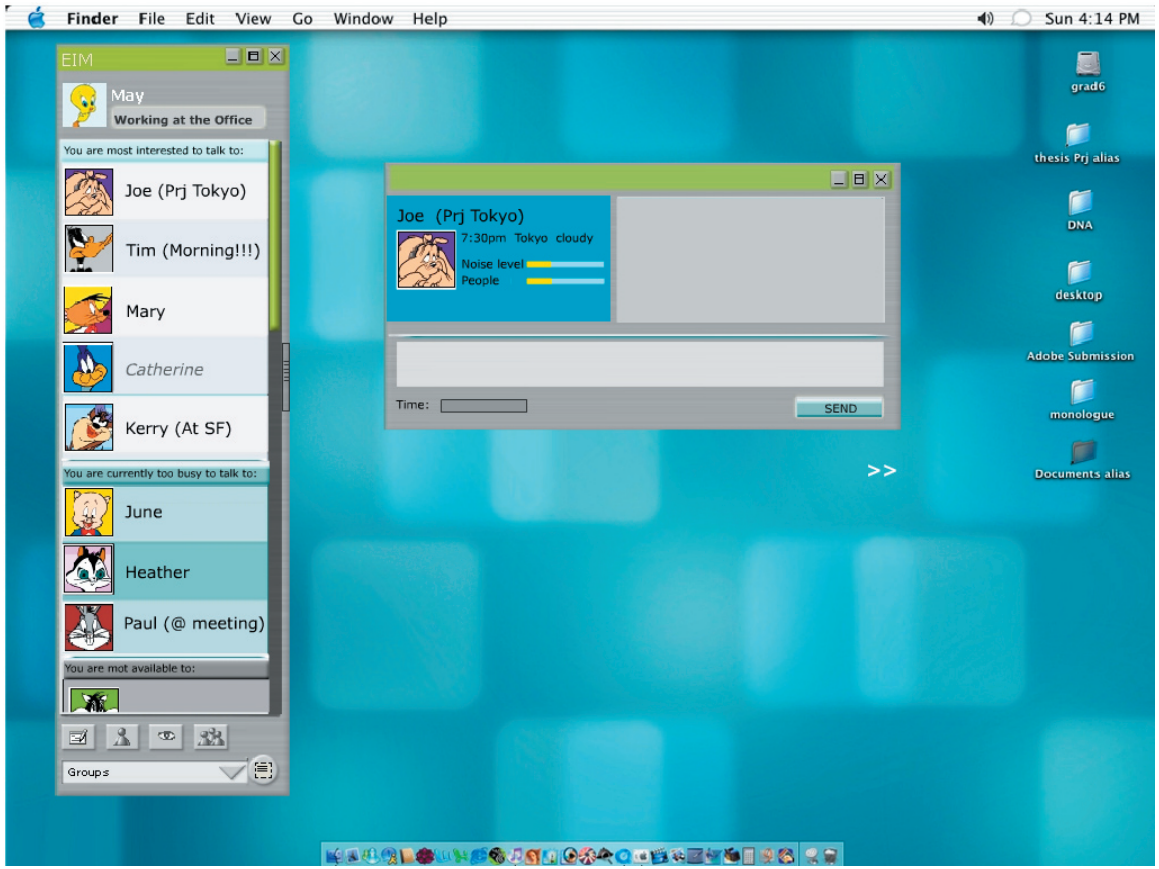
- Time and location information of the user may affect how people construct their messages.



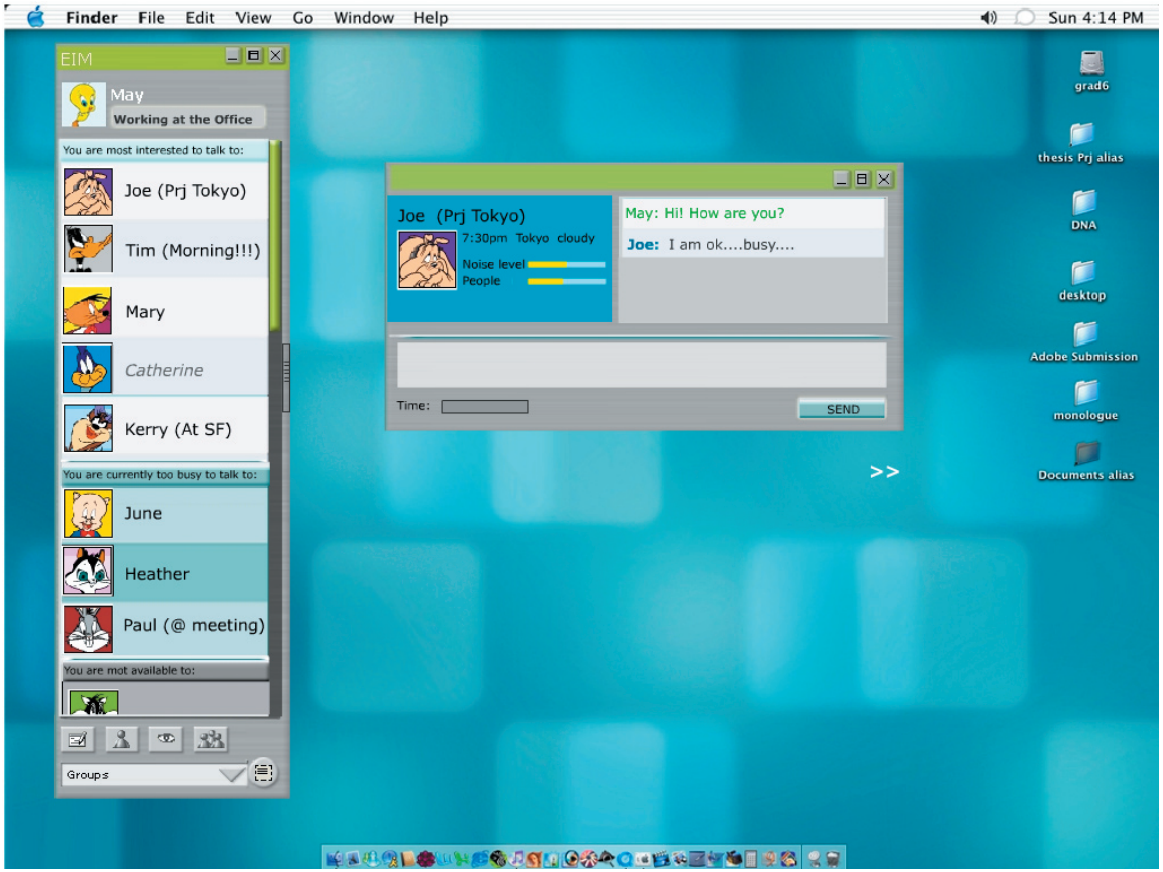
Constructing Message

+ The dialog screen will allow user to see the environment and surrounding information of the other user he/she is talking to.

+ In this case, May wants to keep her conversation with Joe short because it is already after office hour in Tokyo, and she doesn't want to keep him working late in the office.

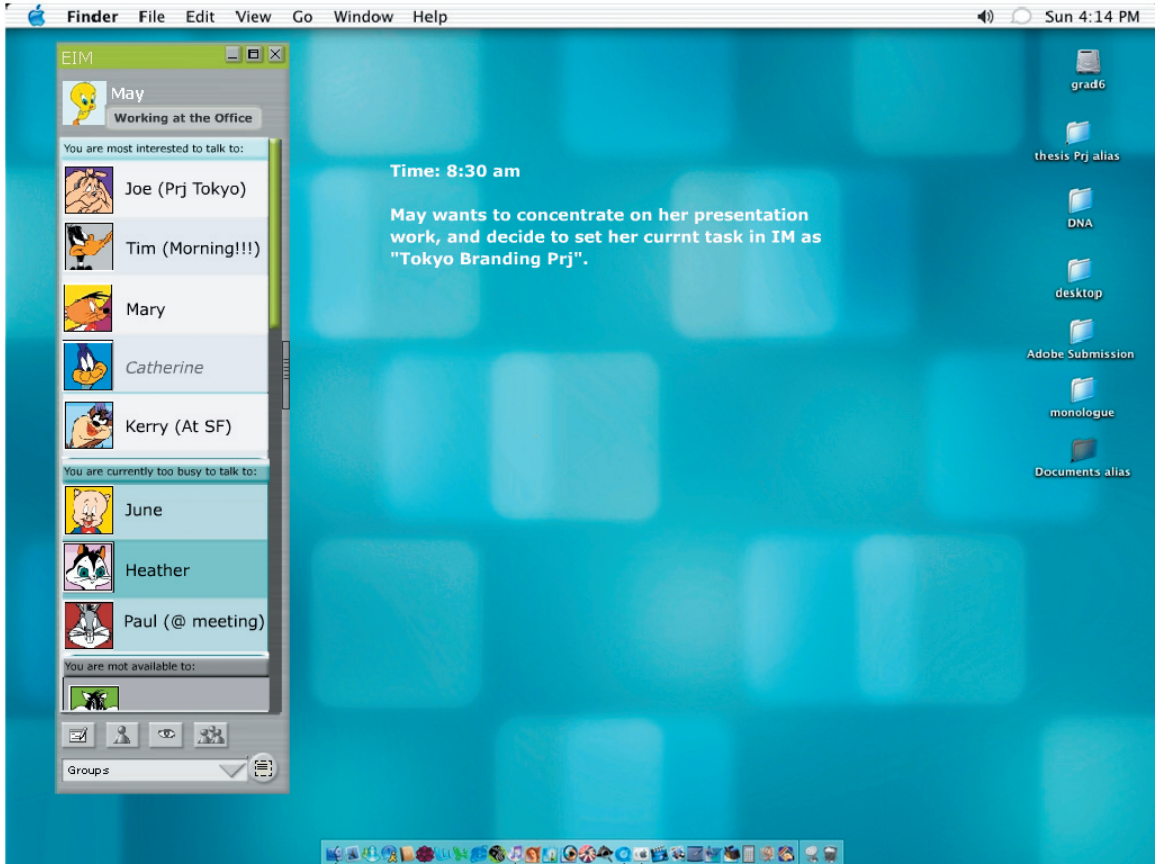


Messaging


Finder File Edit View Go Window Help
Sun 4:14 PM
EIM
May
Working at the Office
You are most interested to talk to:
Joe (Prj Tokyo)
Tim (Morning!!!)
Mary
Catherine
Kerry (At SF)
You are currently too busy to talk to:
June
Heather
Paul (@ meeting)
You are mot available to:
Groups
Joe (Prj Tokyo)
7:30pm Tokyo cloudy
Noise level
People
May: Hi! How are you?
Joe: I am ok....busy....
Time:
SEND
>>
grad6
thesis Prj alias
DNA
desktop
Adobe Submission
monologue
Documents alias

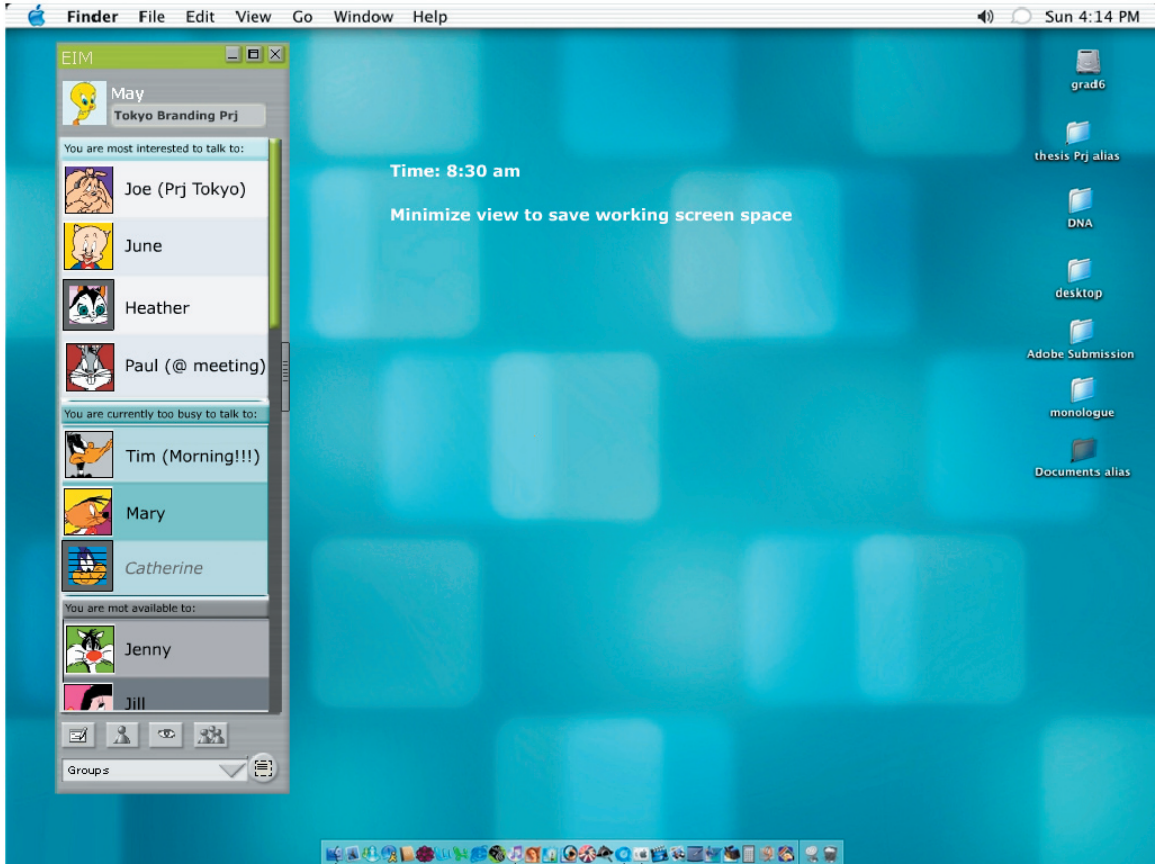
8:30 am - Busy

+ Click on the "profile" buttons to change to a different setting.



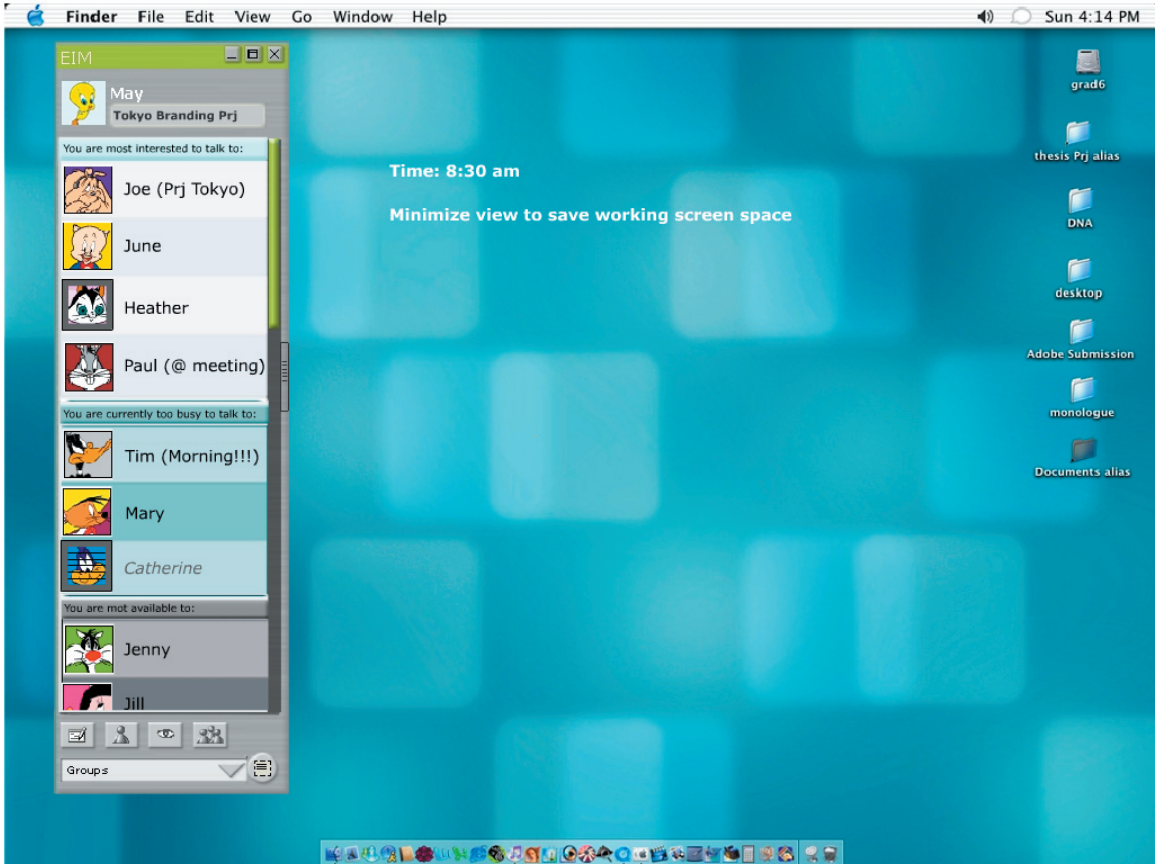
Profile Changed

+ User's profile is now "Tokyo Branding Prj"

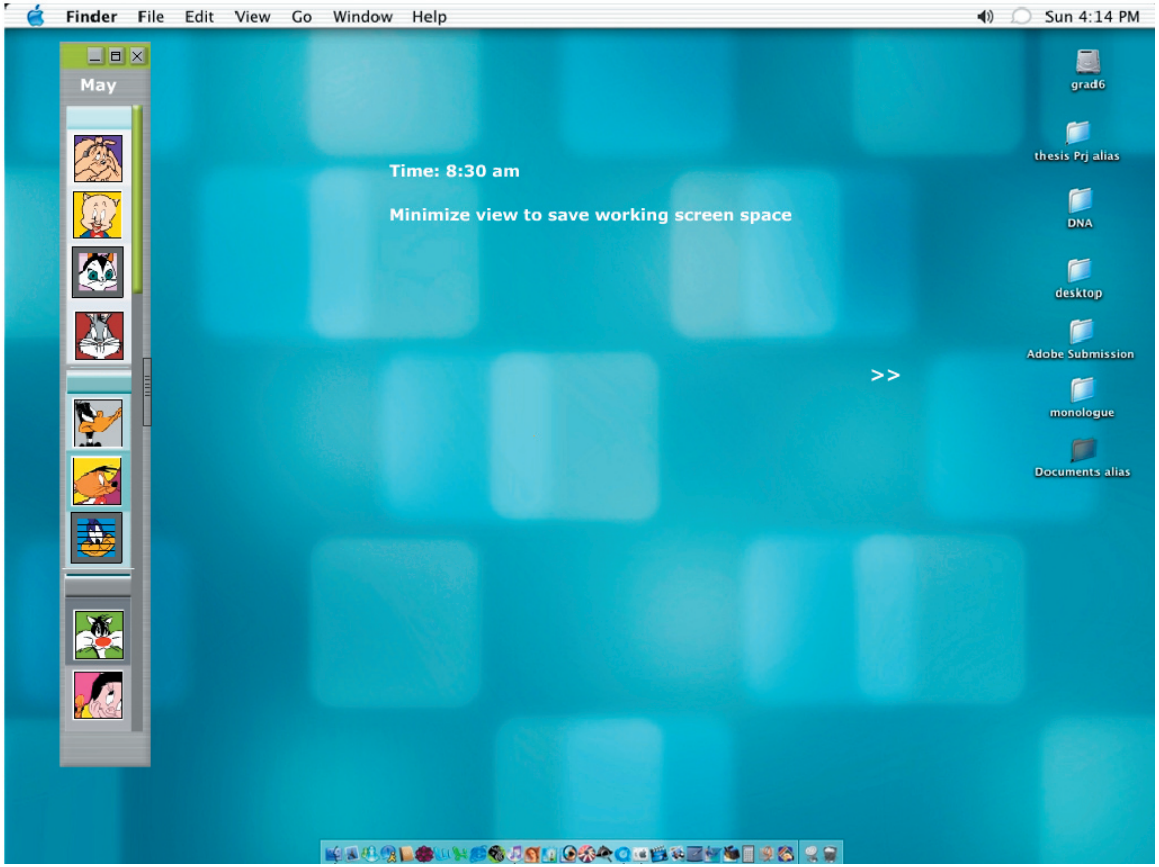


User prefers more screen space

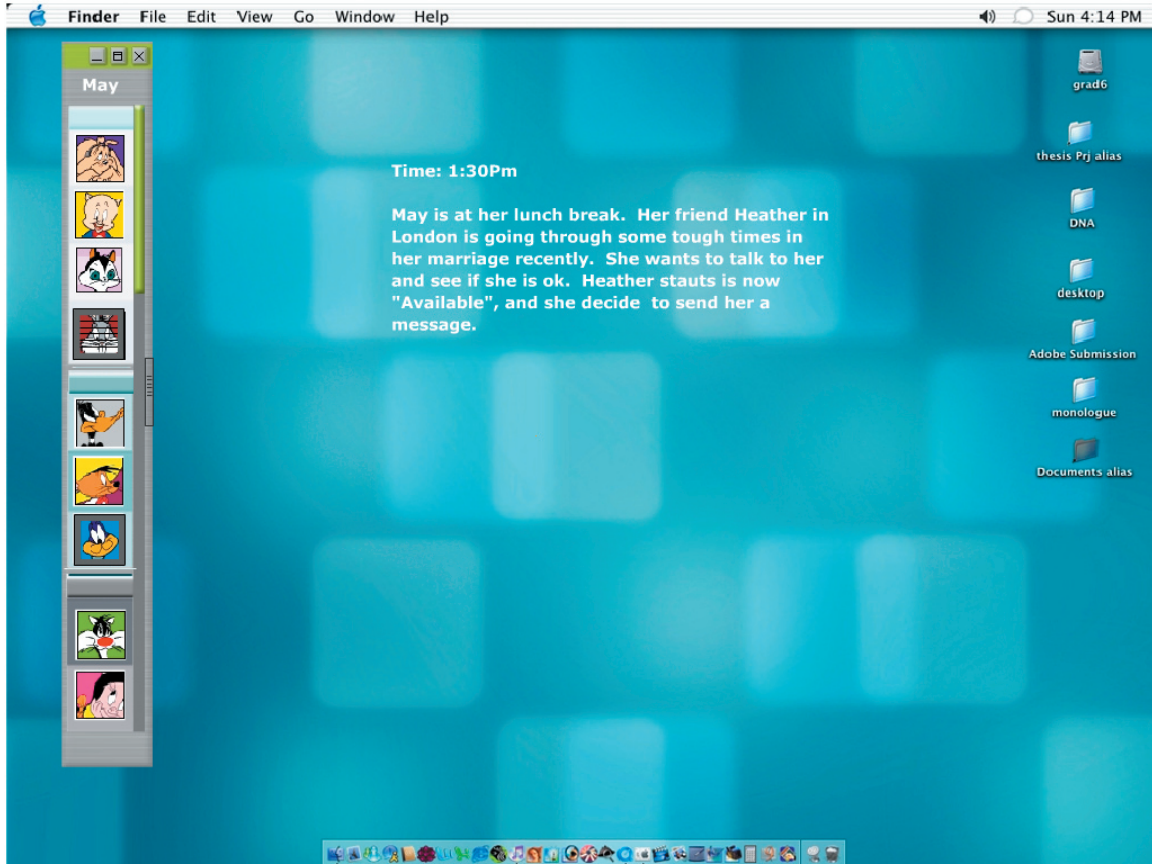
+ Click on the handle to minimize the view.



Minimized View

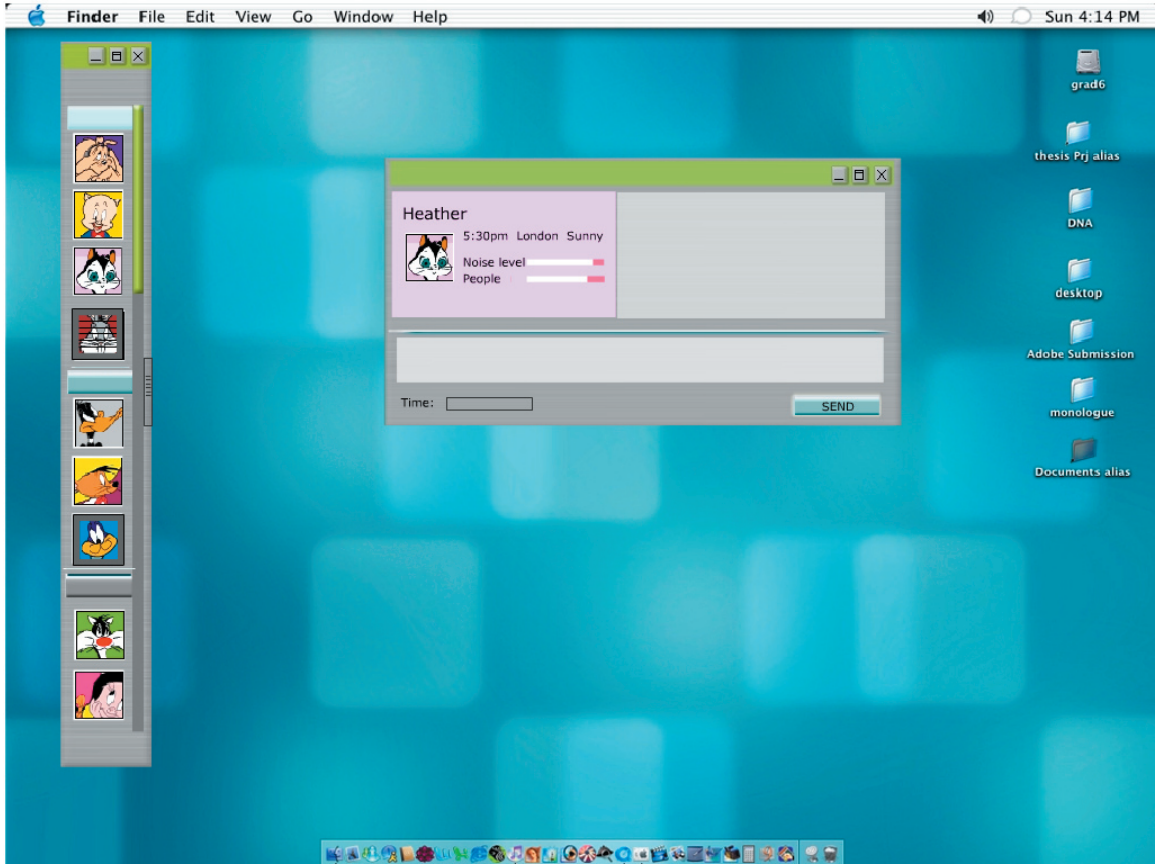


1:30 pm - Sending greetings to friends



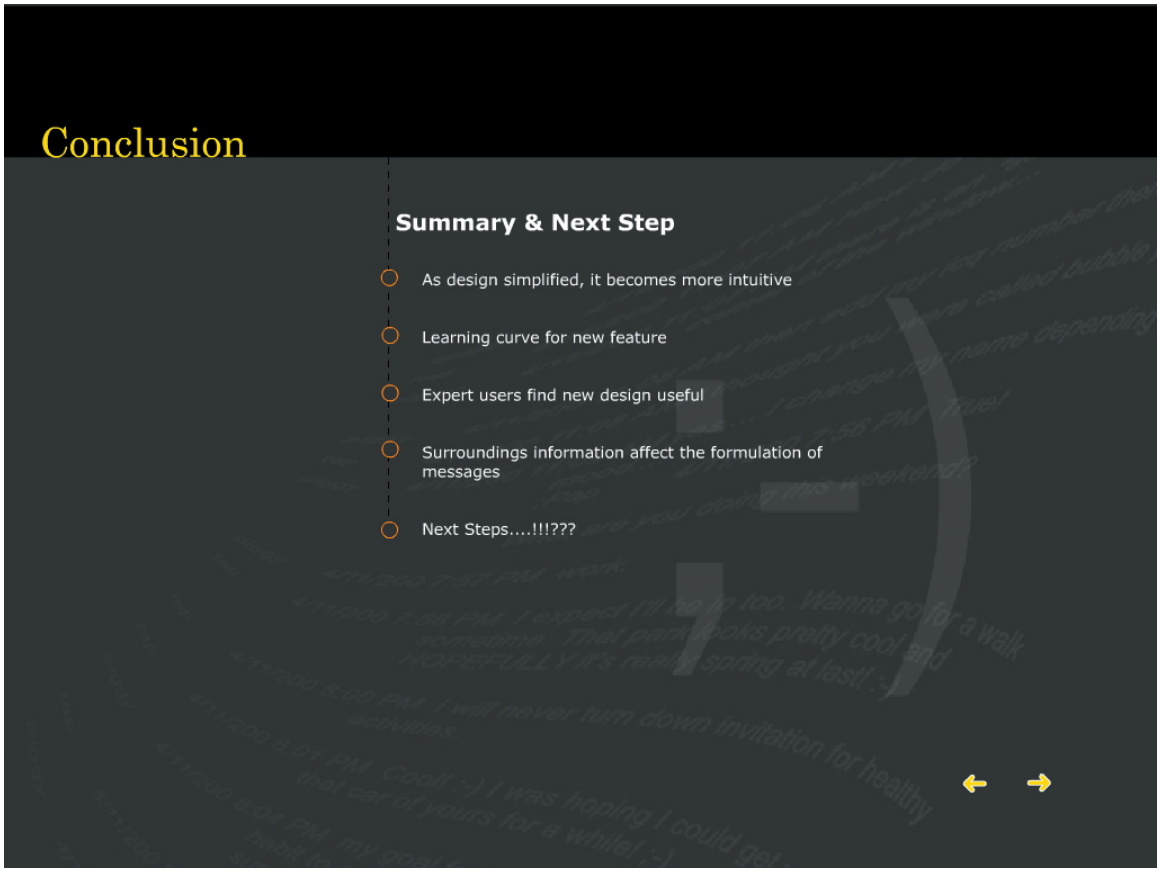
Information affecting how user construct sensitive message

+ May decided not to talk to Heather about her personal problems because there are alot people around her.



Conclusion

Presentation slide 19

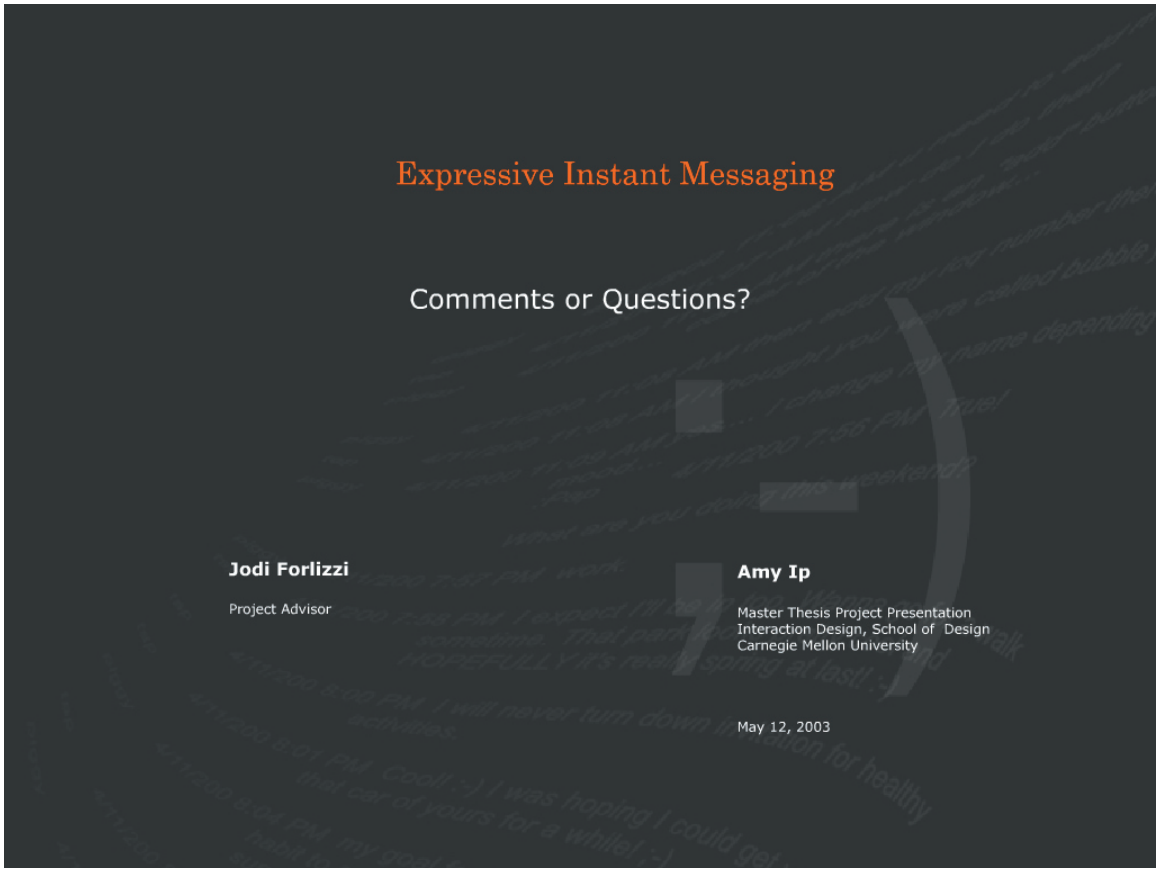


+ There were a few features I would like to include in my design, which includes the ideas of "skins". It will allow the user to have differetn type of display for different preferences or usages.

+ Another idea will be designing features that allow users to express their emotions expressively and accurately.

Questions or Comments

Presentation slide 20



Appendix A :: Research Documents

Appendix B :: Affect Expreiment

Appendix C :: Scenarios

Appendix D :: User Testing