

# Chapter 2

## Memahami dan Mengkonseptualisasikan Interaksi



# Rekap

- HCI telah berpindah dari sekedar merancang antarmuka untuk mesin desktop
- Tentang memperluas dan mendukung segala macam kegiatan manusia di segala macam tempat
- Memfasilitasi pengalaman pengguna melalui perancangan interaksi
- Menjadikan kerja efektif, efisien, dan aman
- Meningkatkan dan tingkatkan pembelajaran dan pelatihan
- Menyediakan hiburan yang menyenangkan dan menyenangkan
- Meningkatkan komunikasi dan pemahaman
- Mendukung bentuk-bentuk baru kreativitas dan ekspresi

# Memahami Lingkup Masalah

- Apa yang ingin Anda buat?
- Apa asumsi Anda?
- Apakah itu akan mencapai apa yang Anda harapkan?

# Apa itu Asumsi?

- mengambil sesuatu begitu saja ketika dibutuhkan penyelidikan lebih lanjut
  - misalnya orang akan ingin menonton TV saat mengemudi.



# Apa itu Klaim?

- menyatakan sesuatu yang benar ketika masih terbuka untuk dipertanyakan
  - misalnya gaya interaksi multimodal untuk mengendalikan GPS - yang melibatkan berbicara saat mengemudi – itu aman.

# Kerangka untuk Menganalisis Ruang Masalah

- Apakah ada masalah dengan produk atau pengalaman pengguna yang sudah ada? Jika ya, apa itu?
- Menurut Anda, mengapa ada masalah?
- Menurut Anda, bagaimana ide desain yang Anda usulkan dapat mengatasi ini?
- Jika Anda merancang untuk pengalaman pengguna baru, bagaimana menurut Anda ide desain yang diusulkan mendukung, mengubah, atau memperluas cara-cara saat ini dalam melakukan sesuatu?

# Aktivitas

- Apa asumsi dan klaim yang dibuat tentang TV 3D?



# Asumsi: Realistik atau Harapan?

- Orang-orang tidak keberatan memakai kacamata yang diperlukan untuk melihat 3D di ruang keluarga mereka - masuk akal
- Orang-orang tidak keberatan membayar lebih untuk layar TV 3D yang baru - tidak masuk akal
- Orang-orang akan sangat menikmati kejernihan yang ditingkatkan dan detail warna yang disediakan oleh 3D - wajar
- Orang-orang akan senang membawa kacamata khusus mereka sendiri - wajar hanya untuk sekelompok pengguna yang sangat terpilih

# Manfaat Konseptualisasi

Orientasi:

- memungkinkan tim desain untuk mengajukan pertanyaan spesifik tentang bagaimana model konseptual akan dipahami

Open Minded

- mencegah tim desain menjadi fokus sejak dini

Common ground

- memungkinkan tim desain untuk menetapkan seperangkat istilah yang disetujui bersama

# Dari Ruang Masalah Hingga Ruang Desain

- Memiliki pemahaman yang baik tentang ruang masalah dapat membantu menginformasikan ruang desain
- Memiliki pemahaman yang baik tentang ruang masalah dapat membantu Anda untuk berdiskusi.
- Tetapi sebelum memutuskannya, penting untuk mengembangkan model konseptual

# Konseptual Model

- Konseptual Model adalah:
  - “Deskripsi tingkat tinggi tentang bagaimana system diatur dan beroperasi.” (Johnson and Henderson, 2002)
- Memungkinkan:
  - “Desainer untuk meluruskan pemikiran mereka sebelum mereka mulai meletakkan widget mereka”.

# Komponen

- Metafora dan Analogi
  - Memahami kegunaan produk dan bagaimana menggunakannya dalam suatu kegiatan
- Konsep yang terpapar dari produk:
  - Objek tugas-domain, atributnya, dan operasinya (misalnya: menyimpan, meninjau kembali, dan mengatur).
- Hubungan pemetaan antara konsep konsep

# Langkah Pertama dalam Merumuskan Model Konseptual

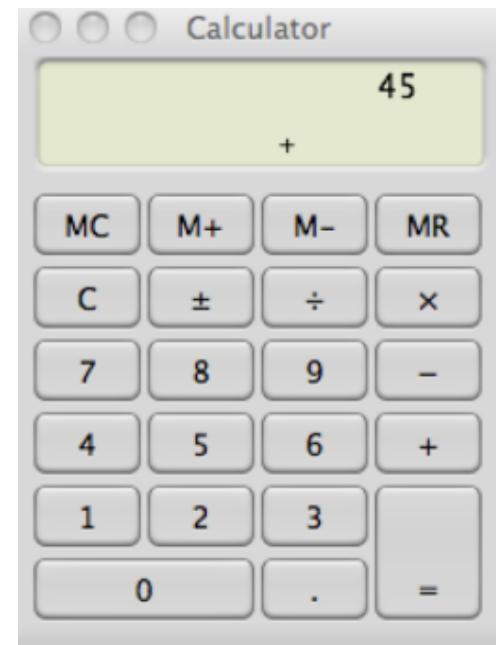
- Apa yang akan dilakukan pengguna saat menjalankan tugas mereka?
- Bagaimana sistem akan mendukung ini?
- Apa jenis metafora antarmuka, jika ada, yang akan sesuai?
- Jenis mode interaksi dan gaya apa yang digunakan?

selalu diingat ketika membuat keputusan desain bagaimana pengguna akan memahami model konseptual yang mendasari.

# Konseptual Model

- Banyak cara untuk mengklasifikasikannya.
- Kami menggambarkan mereka dalam hal kegiatan inti dan objek
- Juga dalam hal metafora antarmuka

# Interface metaphors



# Interface metaphors

- Conceptualizing what we are doing, e.g. surfing the web
- A conceptual model instantiated at the interface, e.g. the desktop metaphor
- Visualising an operation,
  - e.g. an icon of a shopping cart for placing items into

# Activity

- Describe the components of the conceptual model underlying most online shopping websites, e.g.
  - Shopping cart
  - Proceeding to check-out
  - 1-click
  - Gift wrapping
  - Cash till?

# Interface metaphors

- Interface designed to be similar to a physical entity but also has own properties
  - e.g. desktop metaphor, web portals
- Can be based on activity, object or a combination of both
- Exploit user's familiar knowledge, helping them to understand 'the unfamiliar'
- Conjures up the essence of the unfamiliar activity, enabling users to leverage of this to understand more aspects of the unfamiliar functionality

# Benefits of interface metaphors

- Makes learning new systems easier
- Helps users understand the underlying conceptual model
- Can be very innovative and enable the realm of computers and their applications to be made more accessible to a greater diversity of users

# Problems with interface metaphors

- Break conventional and cultural rules
  - e.g. recycle bin placed on desktop
- Can constrain designers in the way they conceptualize a problem space
- Conflict with design principles
- Forces users to only understand the system in terms of the metaphor
- Designers can inadvertently use bad existing designs and transfer the bad parts over
- Limits designers' imagination in coming up with new conceptual models

# Interaction types

- **Instructing**
  - issuing commands and selecting options
- **Conversing**
  - interacting with a system as if having a conversation
- **Manipulating**
  - interacting with objects in a virtual or physical space by manipulating them
- **Exploring**
  - moving through a virtual environment or a physical space

# 1. Instructing

- Where users instruct a system and tell it what to do
  - e.g. tell the time, print a file, save a file
- Very common conceptual model, underlying a diversity of devices and systems
  - e.g. word processors, VCRs, vending machines
- Main benefit is that instructing supports quick and efficient interaction
  - good for repetitive kinds of actions performed on multiple objects

# Which is easiest and why?



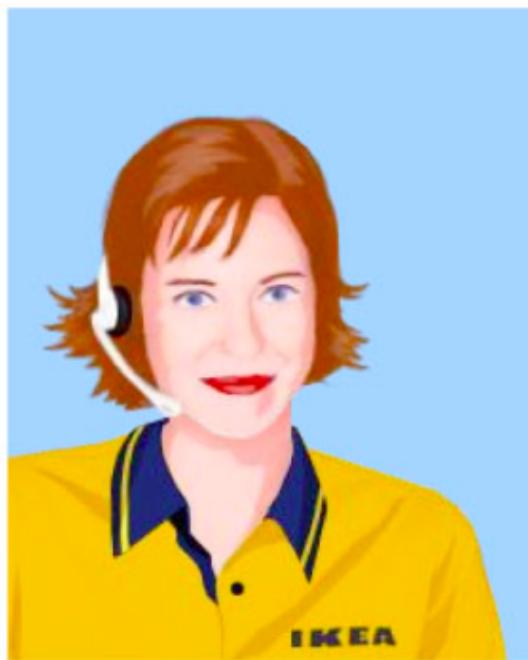
## 2. Conversing

- Underlying model of having a conversation with another human
- Range from simple voice recognition menu-driven systems to more complex 'natural language' dialogs
- Examples include timetables, search engines, advice-giving systems, help systems
- Also virtual agents, toys and pet robots designed to converse with you

# Would you talk with Anna?

IKEA Help Center

[close window](#)



Welcome to IKEA. I'm Anna, IKEA USA's Online Assistant. You can ask me about IKEA and our products and our services. I'll answer your questions, sometimes opening up relevant web pages along the way. Your inputs will be used to improve and expand my knowledge base. Thanks very much.

Go

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# Pros and cons of conversational model

- Allows users, especially novices and technophobes, to interact with the system in a way that is familiar
  - makes them feel comfortable, at ease and less scared
- Misunderstandings can arise when the system does not know how to parse what the user says

### 3. Manipulating

- Involves dragging, selecting, opening, closing and zooming actions on virtual objects
- Exploit's users' knowledge of how they move and manipulate in the physical world
- Can involve actions using physical controllers (e.g. Wii) or air gestures (e.g. Kinect) to control the movements of an on screen avatar
- Tagged physical objects (e.g. balls) that are manipulated in a physical world result in physical/digital events (e.g. animation)

# Direct Manipulation

- Shneiderman (1983) coined the term DM, came from his fascination with computer games at the time
  - Continuous representation of objects and actions of interest
  - Physical actions and button pressing instead of issuing commands with complex syntax
  - Rapid reversible actions with immediate feedback on object of interest

# Why are DM interfaces so enjoyable?

- Novices can learn the basic functionality quickly
- Experienced users can work extremely rapidly to carry out a wide range of tasks, even defining new functions
- Intermittent users can retain operational concepts over time
- Error messages rarely needed
- Users can immediately see if their actions are furthering their goals and if not do something else
- Users experience less anxiety
- Users gain confidence and mastery and feel in control

# What are the disadvantages with DM?

- Some people take the metaphor of direct manipulation too literally
- Not all tasks can be described by objects and not all actions can be done directly
- Some tasks are better achieved through delegating
  - e.g. spell checking
- Can become screen space ‘gobblers’
- Moving a mouse around the screen can be slower than pressing function keys to do same actions

# 4. Exploring

- Involves users moving through virtual or physical environments
- Physical environments with embedded sensor technologies
  - Context aware

# Which conceptual model is best?

- Direct manipulation is good for 'doing' types of tasks, e.g. designing, drawing, flying, driving, sizing windows
- Issuing instructions is good for repetitive tasks, e.g. spell-checking, file management
- Having a conversation is good for children, computer-phobic, disabled users and specialised applications (e.g. phone services)
- Hybrid conceptual models are often employed, where different ways of carrying out the same actions is supported at the interface - but can take longer to learn

# Conceptual models: interaction and interface

- Interaction type:
  - what the user is doing when interacting with a system, e.g. instructing, talking, browsing or other
- Interface type:
  - the kind of interface used to support the mode, e.g. speech, menu-based, gesture

# Many kinds of interface types available...

- Command
- Speech
- Data-entry
- Form fill-in
- Query
- Graphical
- Web
- Pen
- Augmented reality
- Gesture

(for more see chapter 6)



# Which interaction type to choose?

- Need to determine requirements and user needs
- Take budget and other constraints into account
- Also will depend on suitability of technology for activity being supported
- This is covered in course when designing conceptual models

# Paradigm

- Inspiration for a conceptual model
- General approach adopted by a community for carrying out research
  - shared assumptions, concepts, values, and practices
  - e.g. desktop, ubiquitous computing, in the wild

# Examples of new paradigms

- Ubiquitous computing (mother of them all)
- Pervasive computing
- Wearable computing
- Tangible bits, augmented reality
- Attentive environments
- Transparent computing
  - and many more....

# Theory

- Explanation of a phenomenon
  - e.g. information processing that explains how the mind, or some aspect of it, is assumed to work
- Can help identify factors
  - e.g. cognitive, social, and affective, relevant to the design and evaluation of interactive products

# Models

- A simplification of an HCI phenomenon
  - intended to make it easier for designers to predict and evaluate alternative designs
  - abstracted from a theory coming from a contributing discipline, e.g. psychology, e.g. keystroke model

# Framework

- Set of interrelated concepts and/or specific questions for 'what to look for'
- Many in interaction design
  - e.g. Norman's conceptual models, Benford's trajectories
- Provide advice on how to design
  - e.g. steps, questions, concepts, challenges, principles, tactics and dimensions

Concern	Past	Future
Frame of reference	<ul style="list-style-type: none"> <li>users</li> </ul>	<ul style="list-style-type: none"> <li>context</li> </ul>
Method, theory, and perspective	<ul style="list-style-type: none"> <li>scientific approach</li> <li>interaction design</li> </ul>	<ul style="list-style-type: none"> <li>pluralistic</li> <li>mixing</li> </ul>
Outputs	<ul style="list-style-type: none"> <li>ethnographies</li> <li>models and tools for analysis</li> <li>design guidance</li> </ul>	<ul style="list-style-type: none"> <li>insights</li> <li>creating new ways of experiencing</li> <li>value-based analyses</li> </ul>

**Table 2.1** A new framework for human-computer interaction (Rogers, 2009)

# Summary

- Important to have a good understanding of the problem space
- Fundamental aspect of interaction design is to develop a conceptual model
- Interaction modes and interface metaphors provide a structure for thinking about which kind of conceptual model to develop
- Interaction styles are specific kinds of interfaces that are instantiated as part of the conceptual model
- Paradigms, theories, models and frameworks can also shape a conceptual model