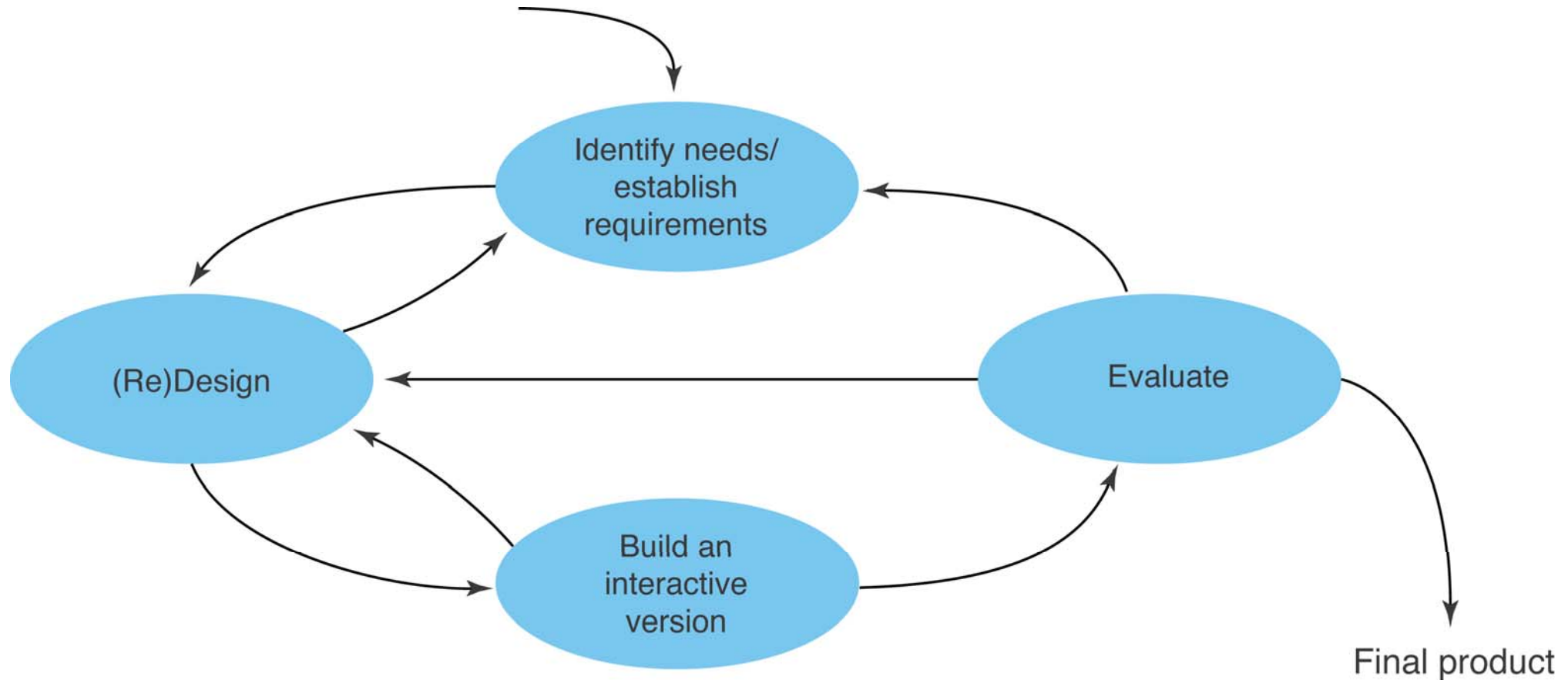


Design and Prototyping

- Conceptual Design
- Physical Design
- Design Rationale
- Prototyping

Recall Design and Prototyping

Recall the simple HCI lifecycle model:



Design: **ideas**

Build an interactive version: **prototypes** to evaluate ideas

Conceptual Design

3 perspectives to develop the **conceptual model**:

1. Which **interaction mode**?

- Mode refers to **how** the user invokes actions when interacting with the system
e.g., instructing: user gives instructions to the system to perform his task such as file printing, file deletion, etc.
e.g., conversing: user performs his task via “talking” with the system such as ticket booking, e-banking
- Can be obtained through requirements activity
- Suggest interaction styles, e.g., fill-in form or speech recognition for search engines, WIMP or command line for file printing

Conceptual Design

2. Any **metaphor**?

- Help people become **familiar** with a new system by relating it with real-world activity $\Rightarrow \uparrow$ **initial familiarity**
e.g., typewriter was metaphor for word processor: when users saw the keyboard on a computer, they assumed that it behaved similarly to the typewriter's keyboard



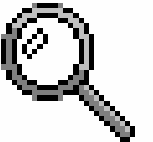
Conceptual Design

e.g., actions of copying, cutting & pasting were well known before computers were invented

- Way to relate a difficult or more abstract concept to a familiar one

e.g., open file  ,save file 

- Disadvantage: metaphor may not be widely known or correctly understood

e.g., 

= find a file?

= zoom a document?

Conceptual Design

3. Any interaction **paradigm**?

- Way of thinking about interaction design based on **technology advances** and **creativity**
- Not well-defined

Examples of paradigms:

- **Time-sharing**
 - 1940s-1950s: explosive technological growth
 - 1960s: need to channel computing power
 - ⇒ single computer that supports **multiple users**

Conceptual Design

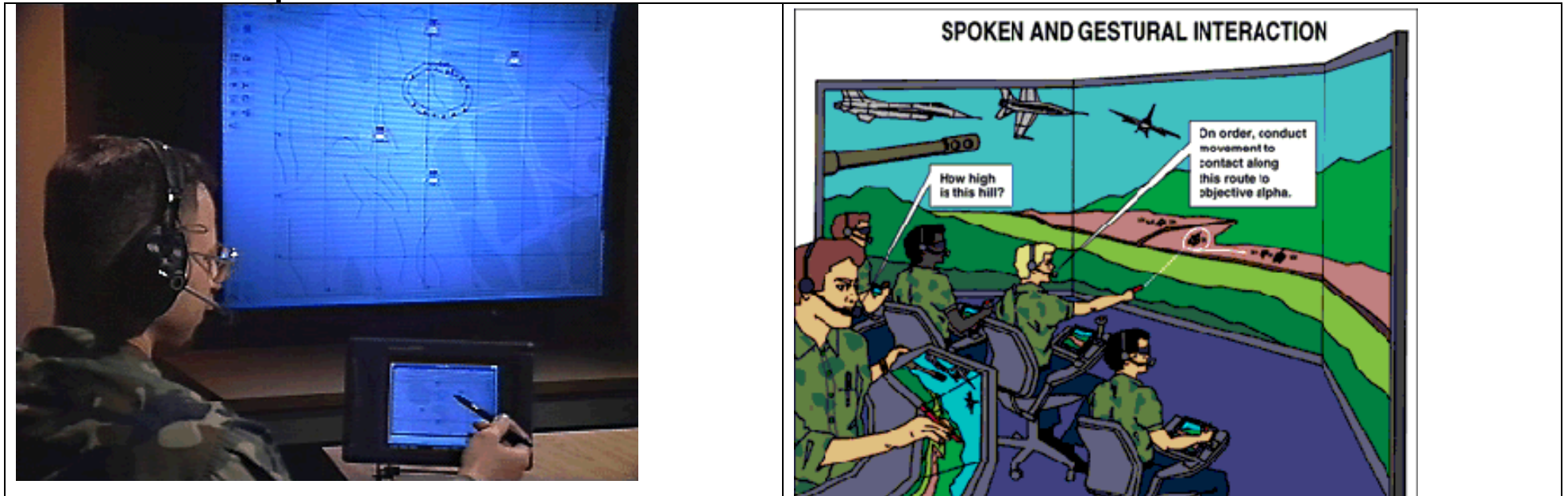
- Window systems & WIMP interface
 - Motivation: human can pursue more than one task at time
 - Windows are used for dialogue partitioning & to “change the topic”
 - 1981: Xerox introduced the first commercial windowing system
 - Windows, icons, menus & pointers are now familiar interaction mechanisms

Conceptual Design

- **Multi-modality**
 - Rely on the uses of **multiple** human communication channels, e.g., visual, touch, speech
 - Each different channel for the user is referred to as a **modality** of interaction
 - **Simple** multi-modal systems:
 - Visual + touch
e.g., editing using a computer
 - Speech + touch
e.g., telephone banking, systems for visually impaired
 - **Complex** multi-modal systems:
 - Extract & combine meaningful multimodal information from multiple, rich, multidimensional inputs

Conceptual Design

- Example : QuickSet



- Input modes: pen, speech, hand-held PC
- Unimodal (speech)
 - "Attack the chemical plant at the base of the hill, to the west side of the lake, with missiles"
- Multimodal (speech + pen)
 - [circles killzone] "missiles strike here"

Conceptual Design

More recent paradigms include

- **Ubiquitous / Pervasive** computing (“ubicomp”):
 - Technology is **embedded** in the environment: when using the system, we are not aware that it is computer
 - Computers would be designed to be embedded in the environment
 - People should be able to access and interact with **information any place** and **any time**
 - It will radically change the way people think about and interact with computers
 - Major rethink of what HCI is in this context

Conceptual Design

上網家電 可監察年邁父母起居

在通訊科技日趨發達下，會發電郵的家電早就耳熟能詳，但最近像松下電業等大公司，想藉監視會發電郵的熱水瓶或煤氣系統的使用率，發揮家居監護作用，這對於人口日趨老化的日本，商機無限。

共同社報道，這些服務的其中一個好處，是避免子女有事沒事也打電話給年邁父母，從而減少衝突。有自動上網功能的家電會傳送資料到子女的手機和電腦，當他們發現家電的使用頻率與平時不同，才聯絡獨自生活的父母也不遲。

松下電業在新年伊始開了幾個新網站，介紹新菜譜和環保資訊外，還包括了一個照顧家居老人的「看護網」，使用者必須先繳付1.5萬日圓（約995港元）費用，然後每月支付3,000日圓（約199港元）服務費，方法是在老人常用的起居室

裝置感應器。

每日電郵通報情況 如平安鐘

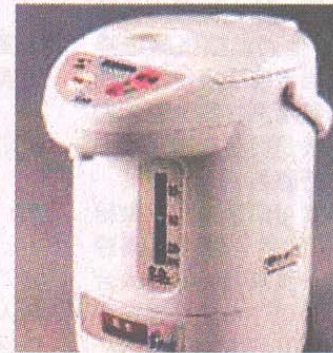
感應器是曉得自動發出信息的「平安鐘」，可以每日一次用電郵通報房內的情況，不論老人「白天喜歡在睡房內躺着」，抑或「晚上去廁所很頻密」等生活細節，子女都可瞭如指掌。

至於有內置無線通訊功能的iPot熱水瓶，首次費用和每月服務費，均與松下電業的感應器相同。Vision Machine由前年開始提供「護身符熱綫」服務，藉iPot使用次數監察家居老人狀況，主要是跟NTT DoCoMo的通訊網絡合作。

東京煤氣公司也不甘後人，推出一項「使用情況通知服務」，透過安裝在煤氣

錶上的通訊器發出電郵，每天兩次通報煤氣的使用情況，其收費更便宜，入會費5,000日圓（約332港元），月費1,470日圓（約98港元），但使用者必須是煤氣用戶。

■高碧斯



松下推出這款曉得自動發放電郵的iPot電熱水瓶，可助子女照顧父母。（互聯網圖片）

Boiling pot with monitoring function by NTT DoCoMo & Panasonic (Hong Kong Economics Times, Jan. 03)

Conceptual Design

相架式掃描器 睇得用得

可想過掃描器可作相架用？電腦產品品牌惠普（Hewlett-Packard）推出全新數碼影像方案系列，當中包括全球首部直立式透明掃描器既是掃描器，又是相架，實行資訊科技產品生活化。

惠普谷資訊科技家品

惠普中國/香港打印及成像系統副總裁兼市場部總經理翁雅麗



惠普推出全球首部直立式透明掃描器。

（陳國峰攝）

昨在產品發布會表示，把資訊科技產品生活化，是其家用產品未來的市場策略，「資訊科技產品已不再給人冷冰冰的感覺。以家用數碼相機為例，每年銷售額以倍數增長，因大家拍了生活照後，可把照片列印、透過電郵送給親友，這些都很生活化。」

她表示，隨著資訊科技產品愈來愈普及，惠普預計今年將有逾10%營業額增長。

毋須駁電腦 可掃描立體

為讓顧客感受其產品在生活上所帶來的便利，惠普在美國便夥拍微軟（Microsoft），開設產品陳列室（experience centre），仿效高級影音產品陳列室，而且亦正研究在本地開設類似陳列室的可行性。

另一方面，翁雅麗提到，惠普每年投放過百億美元在產品開發及設計上，而新推出的直立式透明掃描器可說是其中一件得意之作。「此掃描器可掃描立體物件，又毋須接駁電腦使用，操作簡單又方便，而且放在家中，也可當作裝飾品。」

此外，惠普又與發展商香港興業合作，把直立式透明掃描器或相片打印機及天文望遠鏡，送予愉景灣逸澄閣C座「創意露台」單位的首12位買家。

■本報記者 黃卓敏

Photo frame with scanning function
by HP and Microsoft
(Hong Kong Economics Times,
Sept. 03)

Conceptual Design



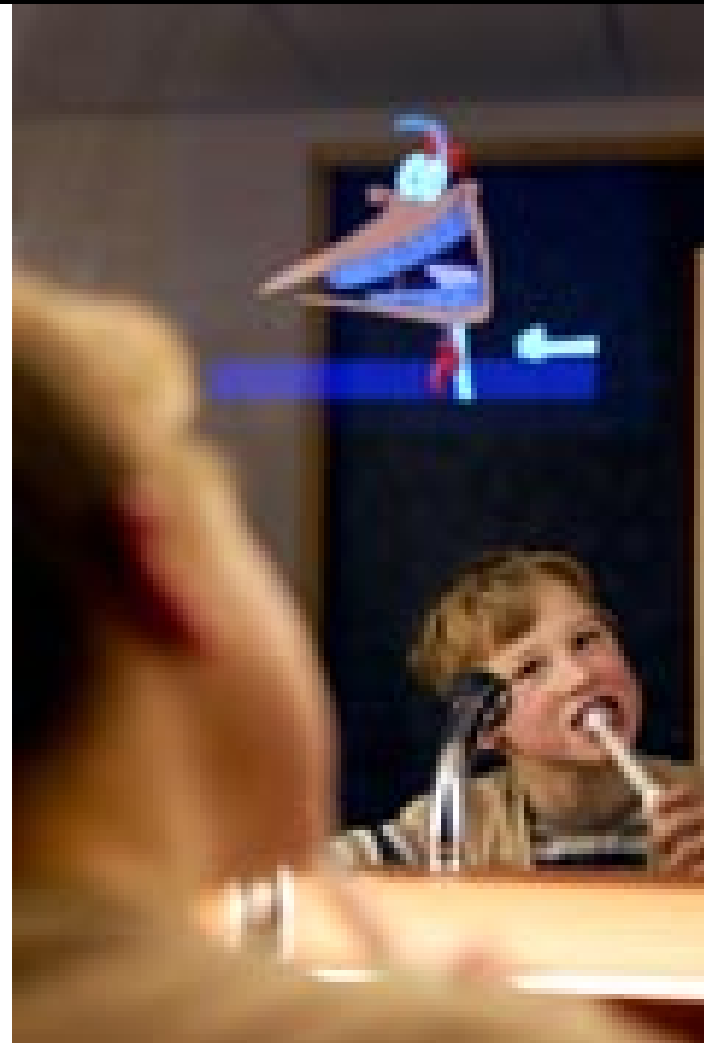
More than a mirror
(Hong Kong Economics Times, Apr.
04)

三 圖片故事 睇得照得
鏡子除了照樣貌，有否
想過也可看電視？飛利浦昨
在港推出首部亞洲區鏡子電
視。關掉電視後，屏幕會迅即變成一面鏡子，有助簡化及美化家
居。
(梁偉榮攝)

Conceptual Design



Display time, weather, heart rate, weight, etc.



Cartoon to guide teeth brushing

Conceptual Design

美戲院「聰明海報」可與人溝通

幾乎自有電影院以來就有電影海報，但紙製海報只能傳達平面信息，要留住行人的腳步，恐怕海報要能跟人溝通才可以。

在史提芬史匹堡執導的科幻電影《未來報告》中，出現過利用全息技術（holography）辨認路人的廣告板，利用湯告魯斯扮演的角色推銷運動衣。美國高科技公司 Thinking Pictures 最近推出的「聰明海報」ThinkPix Smart Displays，雖還未神奇到這種地步，但42吋的平面螢幕，遠比紙板廣告吸引。

事實上，日益普及的平面電視和電腦技術，愈來愈能為廣告界帶來前所未有的商機，例如廣告商 AdSpace Networks 的電子屏幕 Coolsigns，已在多間百貨店及機場等至少逾千個公眾場所賣廣告；在紐約等大城市的麥當勞，亦有數十個賣廣告的平面電視。

廣告隨意輸入 商機無限

這「張」新興起的「聰明海報」，已初步做到跟觀眾有溝通的能力。每一張「聰明海報」背後，都配備度身訂造的電腦和小型擴音器，透過寬頻連結到設在戲院的伺服器，以及 Thinking Pictures 設於紐約曼哈頓區的總部。這個數碼網絡系統，正是「聰明海報」的樞紐所在，讓廣告商隨意將內容輸入進去。

現年42歲的 Thinking Pictures 老闆菲奇（Stephan Fitch），唸研究所時專研數碼電影，他將「聰明海報」的樣子弄得有點像電影《2001年太空漫遊》中會說話的電腦 HAL9000，可見他在科技頭腦之外，亦有搞電影必須的雄奇想像力。

菲奇表示，迄今已獲東、西岸各大戲院採用約30張「聰明海報」，跟他對拆廣告收入。現在他正繼續為電子海報開發更多功能。也許不久的將來，海報上的明星，真箇能伸出頭來，跟路人打個招呼。

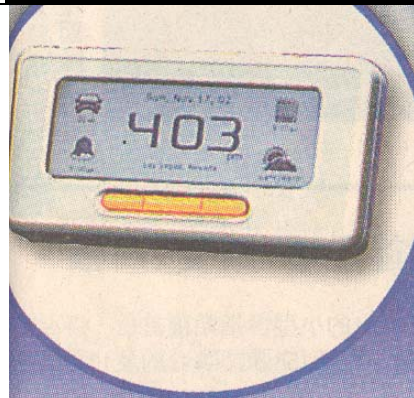
■高碧斯



美國一間戲院外牆上放置的「聰明海報」，吸引途人駐足觀看。

More than a poster
(Hong Kong Economics Times, Dec. 02)

Conceptual Design



微軟聰明旅行鬧鐘

當經過不同時區時，可自動調整時區。可追蹤主人的日程安排（例如早上的會議），從而自動設定適當的響鈴時間，當響鈴時，可以顯示新聞、天氣及交通資訊。

More than clock: with news, transportation information, etc.
(Hong Kong Economics Times, Nov. 02)



腕上個人數碼助理(PDA)

美國著名手錶品牌Fossil，夥拍Palm合作的成果，和今屆Comdex電腦展同步公開推介，但要到明年中才開始在市面發售，售價介乎200至300美元（約1,560至2,340港元）。細小的觸控筆（stylus）附設於錶帶上，PDA數據可與個人電腦互換，每星期只需充電一至兩次。

More than watch: with PDA
(Hong Kong Economics Times, Nov. 02)


Conceptual Design

New thinking/consideration in ubicomp:

- How to enable people to access and interact with information in their work, social, and everyday lives
- How to design user experiences for people using interfaces that are part of the environment with no obvious controlling devices
- How and in what form to provide contextually-relevant information to people at appropriate times and places
- How to ensure that information, that is passed around via interconnected displays, devices, and objects, is secure and trustworthy

Conceptual Design

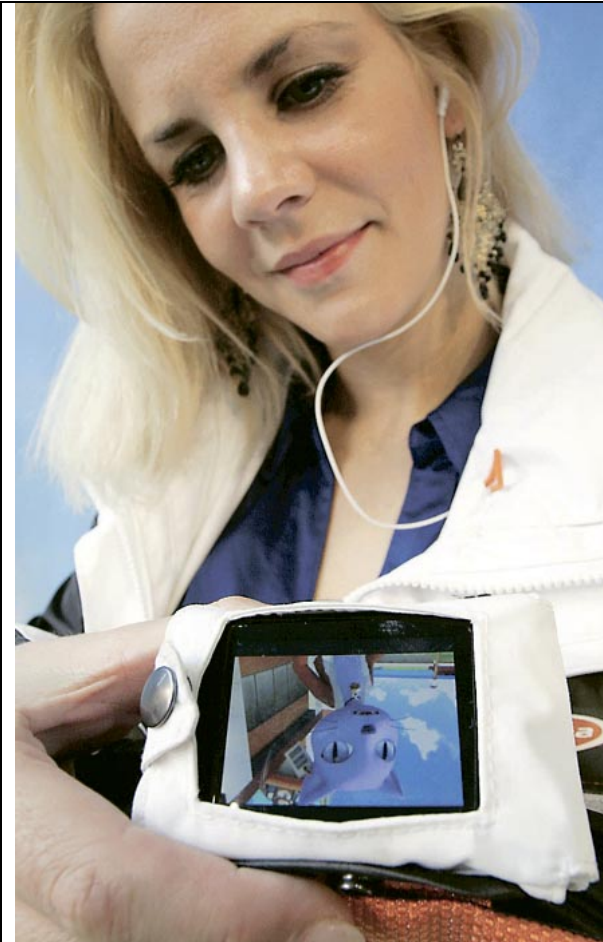
- **Wearable** computing:
 - Also follow-on ubiquitous computing
 - Embed technologies on people's **clothing** such as head-mounted caps, glasses, jackets, etc.
e.g., caps as tour guides that inform users of relevant information as they walk through a museum

<p>形，營造高科技與個人風格。 加上伸縮臂，使眼鏡緊貼不同頭 隨地享受美妙的音樂，獨特外形 ▶ 內置MP3功能，用家可隨時</p>		<p>Eyeglass + MP3 (Hong Kong Economics Times, Nov. 03)</p>
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Conceptual Design



e-jacket: phone, PC, etc.
by Levi's & Philips



Jacket + TV
(Ming Pao, Sept. 07)

Conceptual Design

A Swarovski crystal necklace with MP3 (Hong Kong Economics Times, July 04)

MP3 鑲水晶 二千元有找

MP3機只屬年輕人玩意？本地投資、韓國廠商開發的MP3機新品牌SIGN，在機身加上Swarovski水晶及冷光顯示屏，以品味外形開拓高檔市場，兩款新機售價分別為1,890及1,990元。

重機身設計 攻高檔市場

「據公司內部調查顯示，消費者對MP3的要求，首要是外形，其次才是容量及價錢。」AVC Technology行政總裁蘇智安昨在記者會表示，現時未有針對高檔市場的MP3機品牌，「要開拓高檔市場，機身就要與眾不同，凸顯身份。」

SIGN主要針對亞洲及歐洲市場，因兩市場着重款式及設計，稍後將在韓國、香港、日本、中國大陸等地推出。蘇智安指，目前MP3機最大市場是美國，但以簡單、平價款式為主，第二大市場就是韓國。

「韓國製造技術成熟，市場對產品要求高，因此選在韓國開發產品。」蘇智安說，集團另有平價MP3品牌SOUL主攻美國市場，邊際利潤介乎20%至25%，SIGN則可望達25%以上。他預計，自家品牌SOUL及SIGN全球銷量可達5萬部。

機身輕巧 鑲Swarovski水晶

「全球MP3機用家男女比例相若，現時較少機款針對女性用家。」蘇氏提到，是次推出的SI-200C，特意找來女工程師設計，機身盡量輕巧及細小，方便掛在頸上，而機身鑲有Swarovski水晶，就更像首飾。而另一款新機SI-300，則設計簡約，以專業人士為對象。

品牌無意請代言人作推廣，反而突出推廣品牌為「時尚」產品。「希望聯合其他品牌，突出形象，譬如這次就選用Swarovski。」作品牌應酬會將邀請名人出席，並推出由白金及玫瑰金鑄造外殼的MP3，作慈善拍賣之用，底價8.8萬元。

蘇智安透露，SIGN品牌年內將推出5至6款新產品，除MP3機外，還會推生活品味產品，包括時鐘收音機（clock radio）等。

AVC Technology為AV Concept Holdings（0595）全資附屬機構，去年AV Concept Holdings營業額逾17億元，集團預計至05年底，用於韓國的研發投資將不超過1,000萬元。

■本報記者 陳倩敏



▲SIGN的MP3機重機設計，針對高檔市場，希望其邊際利潤達25%以上。
▲近似首飾的設計，專門針對女性用家。（趙家富攝）

Conceptual Design

- **Attentive environments** computing:
 - System “estimates” the user needs without user’s instructions or controls
 - Computer interfaces that can respond to user’s expressions, gestures, etc.

聰明電話懂按心情接來電

✿美國卡內基美隆大學的科學家，正研製一種會自動因應主人心情而決定接聽與否的「聰明電話」，可以擔當接綫生的角色。這個名為Sensay的電話，利用放置於身體上的感應器，可以知道主人是否忙碌或心情不佳，自動播出生帶叫來電者稍後再致電。

Smart telephone which helps us to receive a call or not
(Hong Kong Economics Times, Sept. 03)

Conceptual Design

豐田「表情汽車」構思

豐田「表情汽車」獲專利

汽車會哭會笑，相信大家只會想到卡通片的情節，但原來豐田（Toyota）真有這個構想，生產有表情的汽車，讓駕駛者有多些娛樂，而這個構思已取得專利。

駕駛者駕車時，經常會遇到一些氣憤或愉快的事，如後車胡亂切綫，會令人感到不滿；但獲其他人讓綫，又會希望表示謝意。不過，身在車中的駕駛者難以表達這些不滿或謝意，故四位來自豐田的發明家決定要令汽車表達感情。

有表情的汽車一如卡通片中的汽車，以車頭燈作眼睛，有眼簾和眼眉，亦有一條模仿動物尾巴的天綫。汽車裝有電腦及軟件系統，可探測路面及汽車狀況，如軚盤角度、煞車效率及車速等，駕駛者或乘客可向系統輸入「心情」。

天綫會擺尾 車頭燈顏色表達心情

駕駛者想表示善意讓其他車先行，車頭燈及眼眉會轉為橙色，眼簾半開（模擬笑着），車尾的天綫會如動物擺尾般左右搖擺。汽車出現故障，車頭燈會變為憂鬱的藍色，眼簾低垂，以及「淚」燈閃爍。

設計師在設計汽車表情時，以傳統上各種顏色予人的感覺為依歸，如橙色表示心情好，紅色表示憤怒或驚訝，綠或藍等冷色表示憂愁和哭泣等。豐田表示，已取得的專利亦可用於電單車、船或飛機上。

Future car which has different expressions according to driver's emotion
(Hong Kong Economics Times, July 04)

Conceptual Design

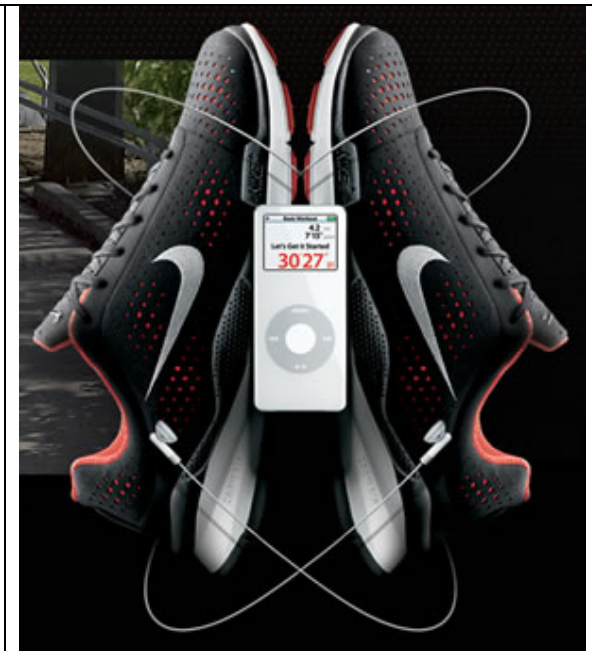
Trends:

- Move “beyond the desktop”, due to the advent of wireless, mobile and handheld technologies
- Collaboration between companies of different natures of business

e.g., The kit allows Nike shoe to talk to iPod nano. The sensor uses a sensitive accelerometer to measure activity, then wirelessly transfers this data to the receiver on iPod nano (May 2006)

e.g., MP3 player by Philips and Nike

More can be found from newspaper reading, Web surfing, shopping, etc.



Conceptual Design

Can be expanded further:

- **What functions** will the product perform?
 - How the task is divided between user and system? What will the product do? What will the human do?
- How are the **functions related** to each other?
 - Procedure in doing the task, e.g., sequential or parallel?
 - Can different tasks be grouped as a categorization, e.g., cut, copy, paste
- What **information** needs to be available?
 - What data is required to perform the task?
 - How is this data to be transformed by the system? e.g., display the data using a graph or list of numbers

Physical Design

Consider more concrete, detailed issues of the design:

- How information is presented and interacted in the interface? e.g., fill-in forms, command line
- Combination of media? e.g., sound and animations
- What kind of feedback? e.g., voice, colour change
- What combinations of input and output devices? e.g., speech, keyboard+mouse, handwriting recognition
- Controlled by software or hardware? e.g., use WIMP to start scanning or use a button on scanner to do so
- Whether to provide agents and in what format?
- How to design menu, icon, screen and display information?

Iterations are required between physical and conceptual design

Physical Design

Shneiderman's eight golden rules:

- Strive for **consistency**: e.g., consistency in layout, font
- Enable frequent users to use **shortcuts**: e.g., "Ctrl+S" is faster than using WIMP to save
- Offer informative **feedback**
- Acknowledge task completion: make it clear when an action has successfully completed, e.g., "printing completed"
- Offer **error** prevention and simple error handling
- Permit easy **reversal of action**, e.g., provide "undo"
- Support **control** principle of usability: users feel more comfortable if they feel in control of the interaction
- Reduce short-term memory load: e.g., use recognition instead of recall

Physical Design

A number of design rules, guidelines, principles exist, e.g.,

- D.Mayhew, *Principles and Guidelines in Software User Interface Design*: Design of interaction styles: menu, fill-in forms, etc.
- D.D.McCracken and R.H.Wolfe, *User-Centered Website Development: A Human-Computer Interaction Approach*: Web design
- S.Weinschenk and D.T.Barker, *Designing Effective Speech Interfaces*, Wiley (2000): Speech interface design

Standards also help:

- Set by national or international bodies to ensure compliance by a large community of designers
- High authority and low level of detail
e.g., ISO 14915: user interface of multimedia applications

Design Rationale

A technical term for the **documentation** used in choosing among alternative designs

⇒ Assist in understanding the design of the system

- **Benefits**

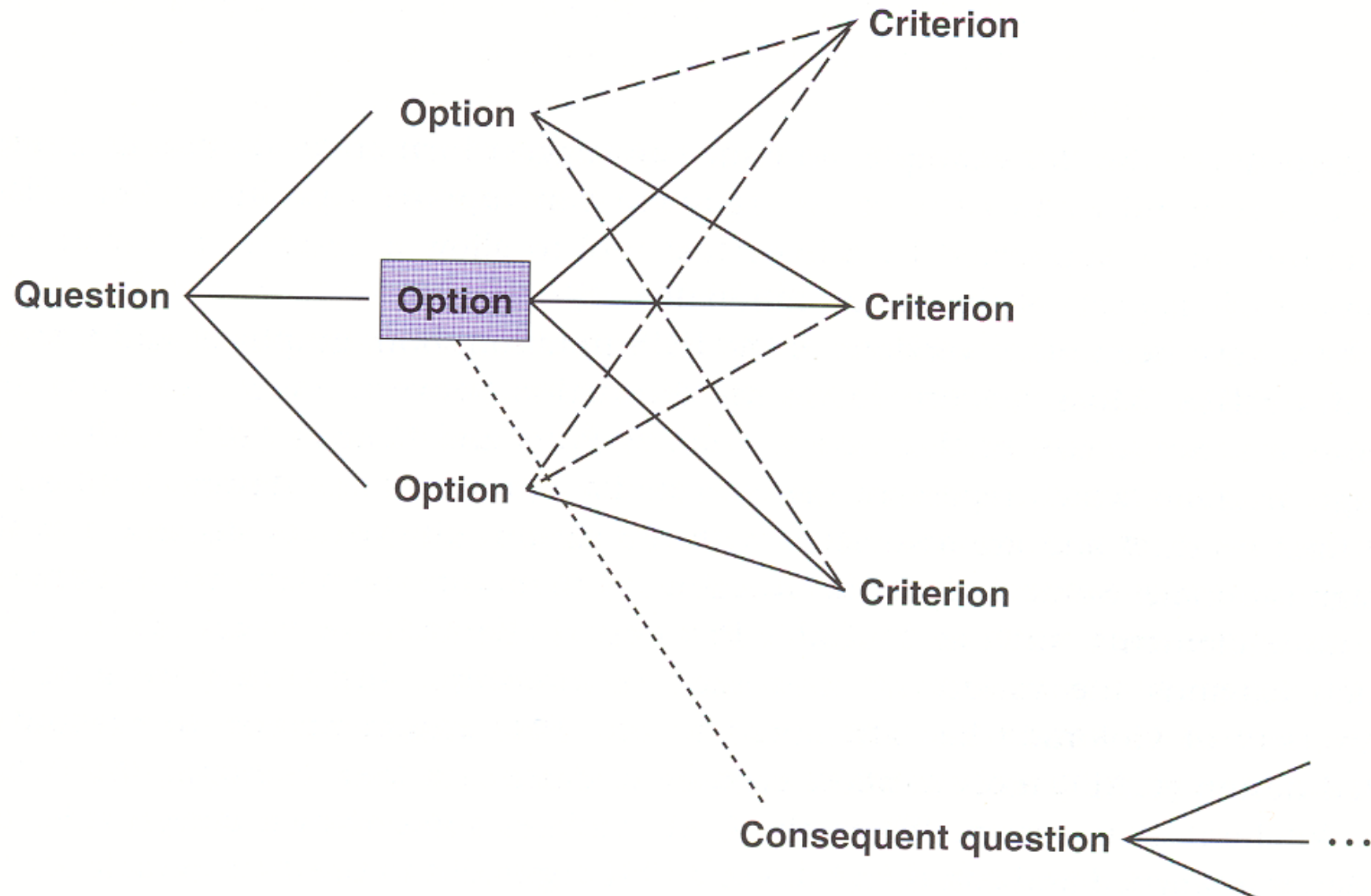
- Communication among design team members throughout life cycle
- Reuse of design knowledge across products (e.g., WORD → PowerPoint)
- Enforce design discipline (the designer should deliberate more carefully)
- Present arguments for design trade-offs

Design Rationale

A common approach: **Design Space Analysis**

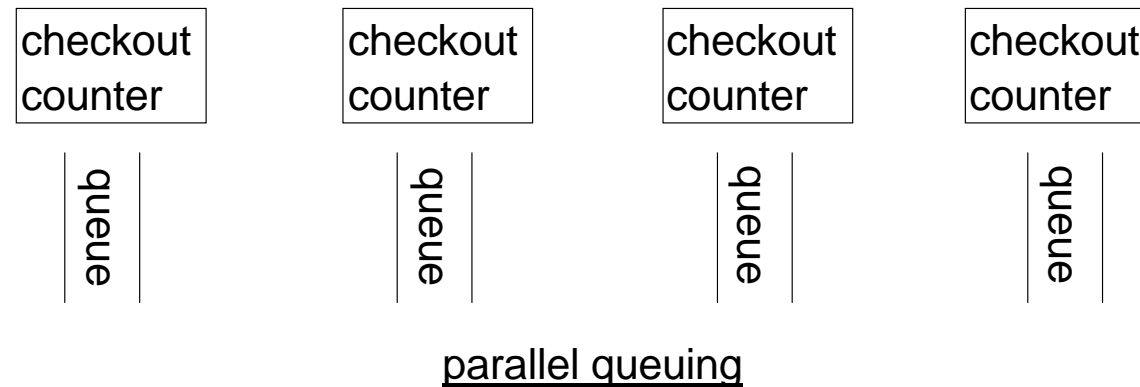
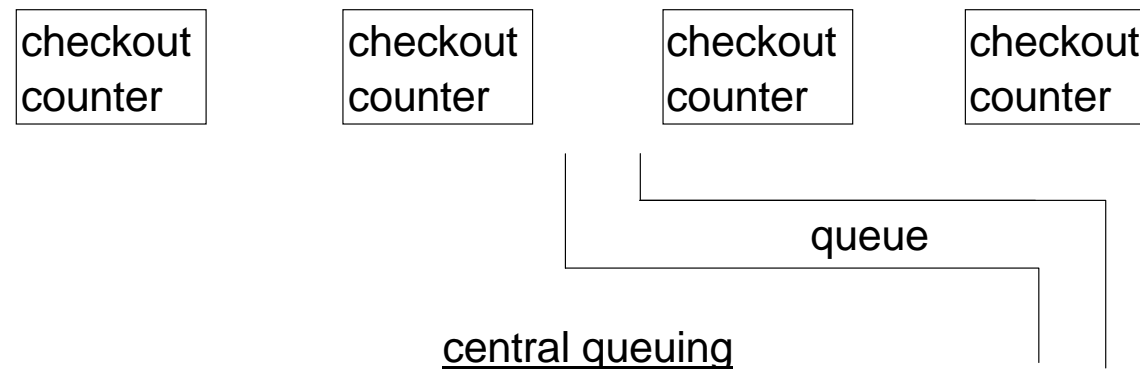
- Notation: Questions, Options, Criteria (QOC)
 - **Questions** (& sub-questions) represent major issues of a design - key issues in design
 - **Options** provide alternative solutions to the question - possible design decisions
 - **Criteria** are the means of assessing the various options in order to make a choice - bases for choosing between options
- Design space includes **all** possible options, including those rejected
- **Structure**-oriented

Design Rationale



Design Rationale

- Example: Questions: Which queuing-up system should be used?
option #1 : **central queuing**
option #2 : **parallel queuing**

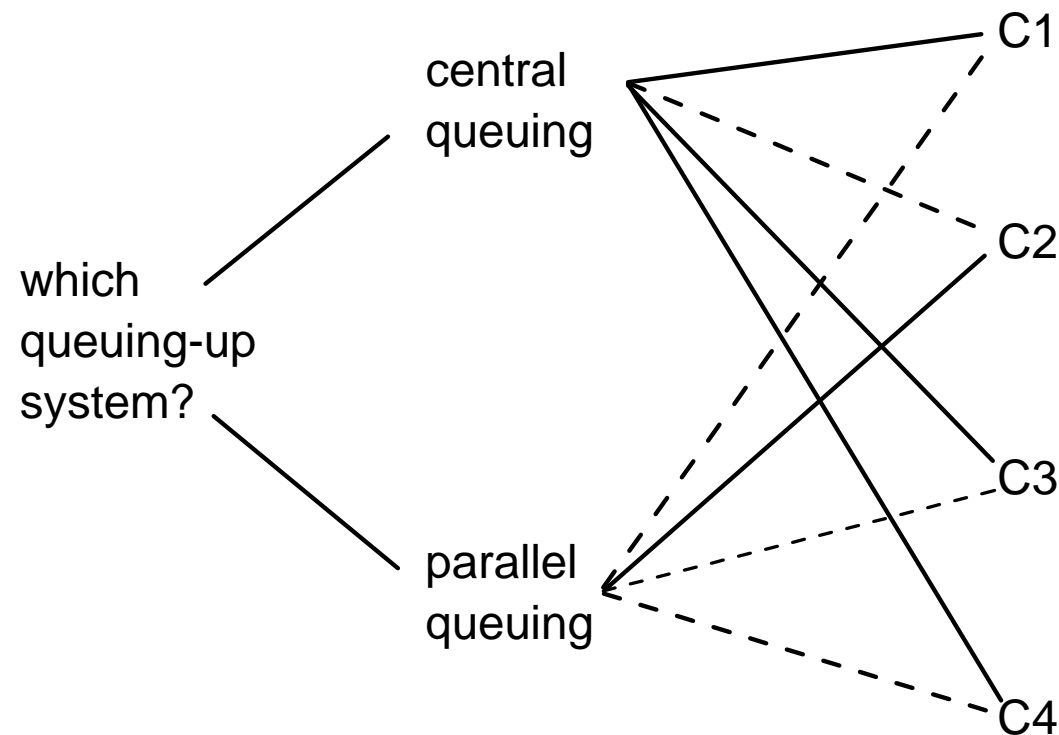


What are the possible criteria?

Design Rationale

Possible criteria are:

- C1: Maximize checkout counter efficiency
- C2: Customer freedom of choices
- C3: Minimize average queuing-up time
- C4: Minimize queuing space



Design Rationale

- Effective design space analysis can be achieved from
 - Raising the **right questions**
 - Deciding the **correct criteria** to judge the options
 - **Initial questions** raised must be sufficiently general that they cover a large enough portion of the possible design space but specific enough that a range of options can be clearly identified
- **Hints** for doing QOC:
 - Options:
 - Use criteria to generate options
 - Consider extreme, distinctive or novel options
 - Look for novel combinations of options
 - Criteria:
 - Design a set of criteria
 - Represent positive and negative criteria

Design Rationale

- Good practice for **questions**:
 - Does question compare at least two **alternatives**?

Q: Shall we use colour to attract attention?
O: Yes
O: No



Q: How should attention be attracted?
O: By colour
O: By flashing



Design Rationale

- Does question focus on a **single** issue?

Q: What should alarm look like?

- O: Red
- O: Large
- O: Flashing

✗

Q: What colour should alarm light

- O: Red
- O: Blue
- O: Yellow

✓

Q: What size should alarm light

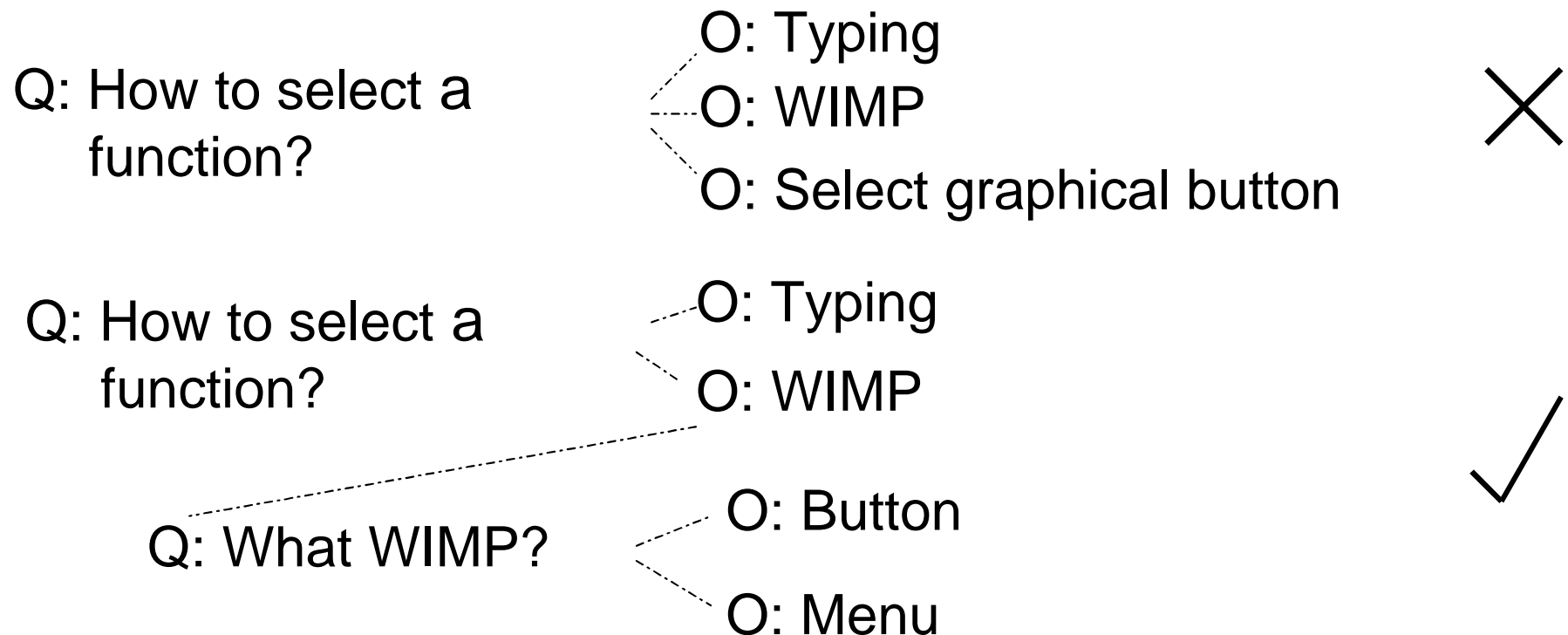
- O: Large
- O: Small

✓

- Questions can be at different levels:
 - e.g., What color should the alarm lights be?
 - e.g., How should attention be attracted? (more abstract)

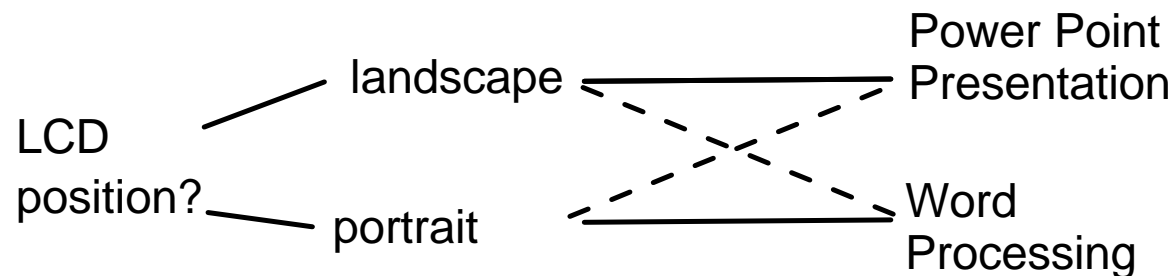
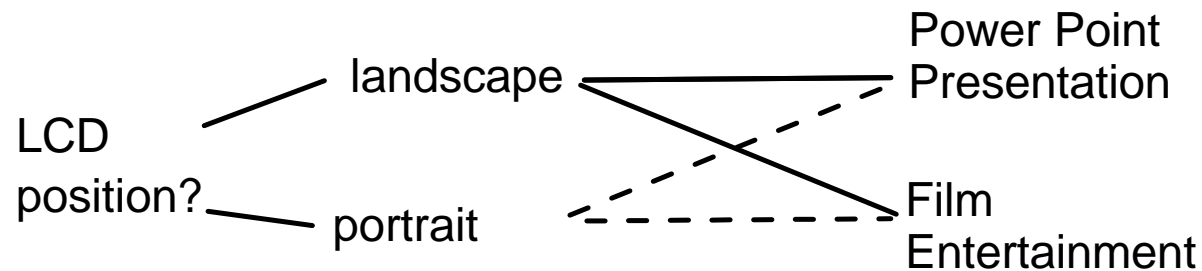
Design Rationale

- Good practice for **options**:
 - Are options at the same level of abstraction?



Design Rationale

- Good practice for **criteria**:
 - Are criteria useful for assessing & comparing appropriate features of options?



Prototyping

What is **prototype**?

Architecture: a miniature building or town

Electronics: a workable electronic board

In HCI, prototype is used to simulate or animate (some) features of the intended system during design process

A **physical representation** of conceptual/physical design, e.g.

- a series of screen sketches
- a storyboard, i.e. a cartoon-like series of scenes
- a cardboard mock-up
- a piece of wood (e.g., Palmpilot)
- a piece of software with limited functionality written in the target language or in another language
- a Powerpoint slide show

Prototyping

Why prototype?

- Evaluation and feedback are central to interaction design
- Stakeholders can see, hold, interact with a prototype more easily than a document or a drawing
- Effective communication device among team members
- Effective way to test designer's ideas
- Prototypes answer questions, and support designers in choosing between alternatives
- Implementation is expensive, if no prototyping
 - ⇒ any design errors are built in to the first implementation you can test, and it is expensive to make changes
 - ⇒ design errors may be left in the final product

Prototyping

Benefits of prototyping:

- Improve the chances of creating a usable product, since mistakes and omissions are flushed out early in the development process, not after implementation
- Users are good at criticizing an existing system; they are much less able to imagine how specifications would translate into a product
- Prototyping brings the users into the process at a much earlier stage
- Higher user satisfaction and acceptance on the developed interactive products

Recognized ~20 years ago: Maryam Alavi, "An Assessment of the Prototyping Approach to Information Systems Development," *Communications of the ACM*, June, 1984

Prototyping

What to prototyping?

- Technical issues (e.g., capture video using a watch)
- Work flow, task design (e.g., procedure of taking a photo using a digital camera)
- Screen layouts and information display (e.g., layout of a Web)
- Difficult, controversial, critical areas, e.g., control types on portable media player (PMP)?



Prototyping

Low-fidelity prototyping:

- Not look very much like the final product
- Use a medium which is unlike the final medium, e.g. paper, cardboard, etc.
- Quick, cheap and easily changed
- Can be sketches of screens, storyboards, etc.

High-fidelity prototyping:

- Use materials that expect to be in the final product
- Look much more like final system than low fidelity version
- Software prototyping tools include Visual Basic, Macromedia Director, etc.

Prototyping

Can be classified into 2 types:

- **Evolutionary**: the prototype eventually becomes the product
- Revolutionary or **throwaway**: the prototype is used to get the specifications right, then discarded

Can also be classified into:

- **Horizontal** prototype: provide a wide range of functions, but with little detail
- **Vertical** prototype: provide a lot of detail for only a few functions

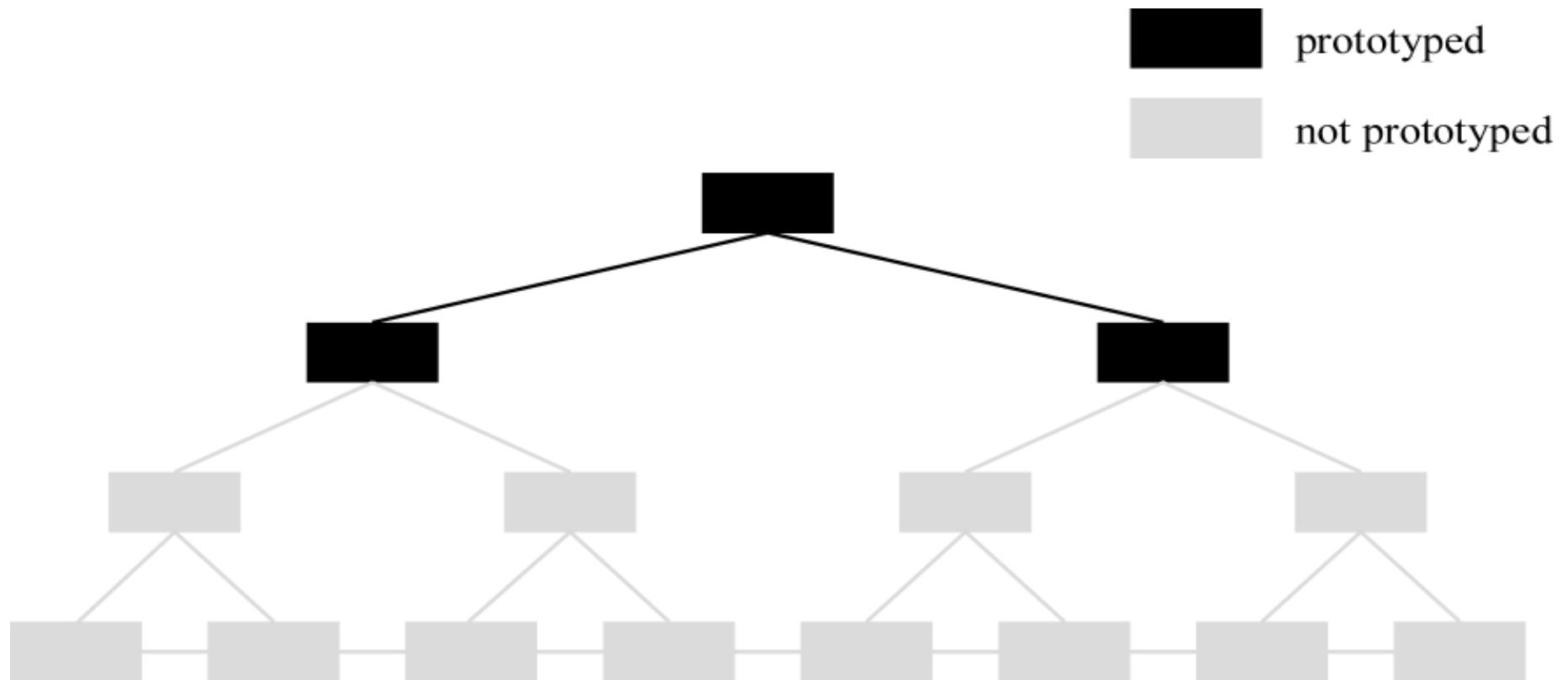
⇒ Compromises are needed in prototyping

Prototyping



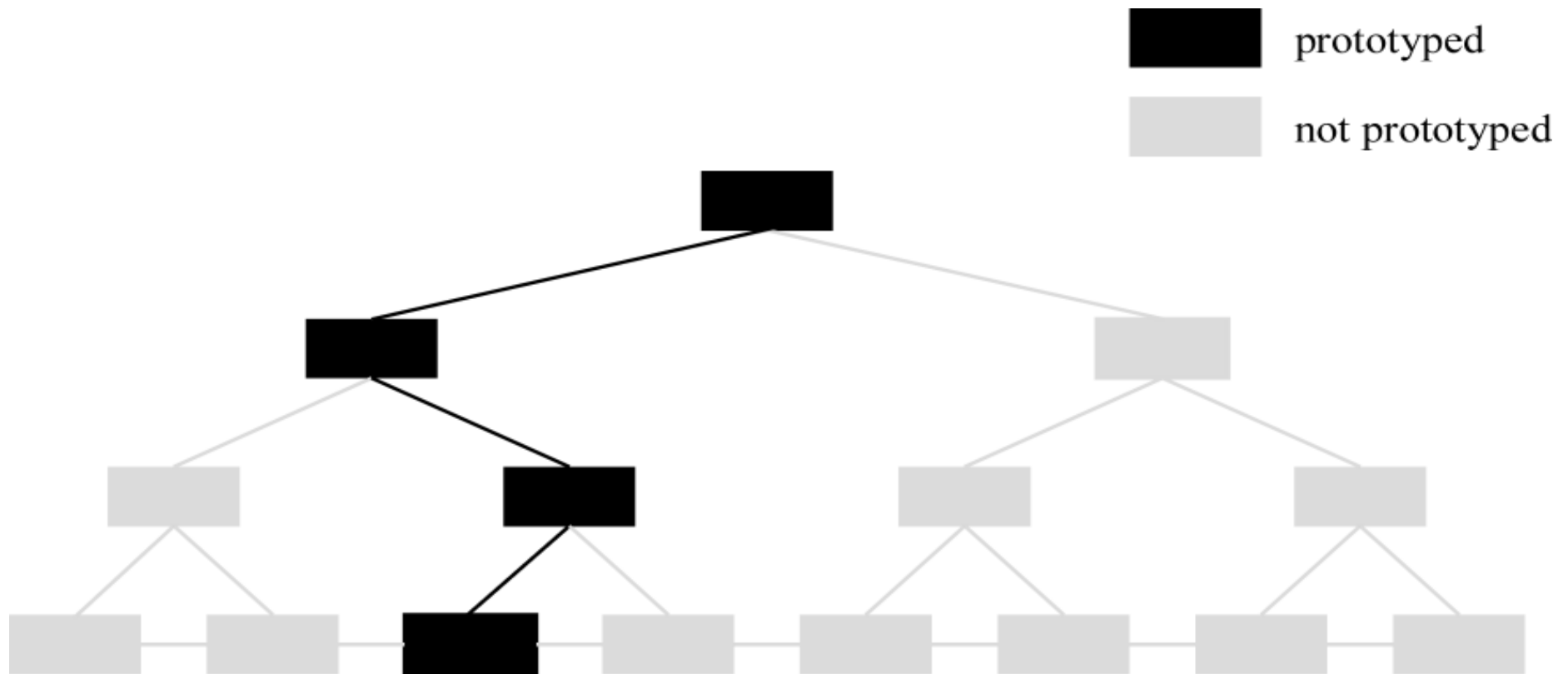
Prototyping

Horizontal prototype: broad but only top-level



Prototyping

Vertical prototype: deep, but only some functions



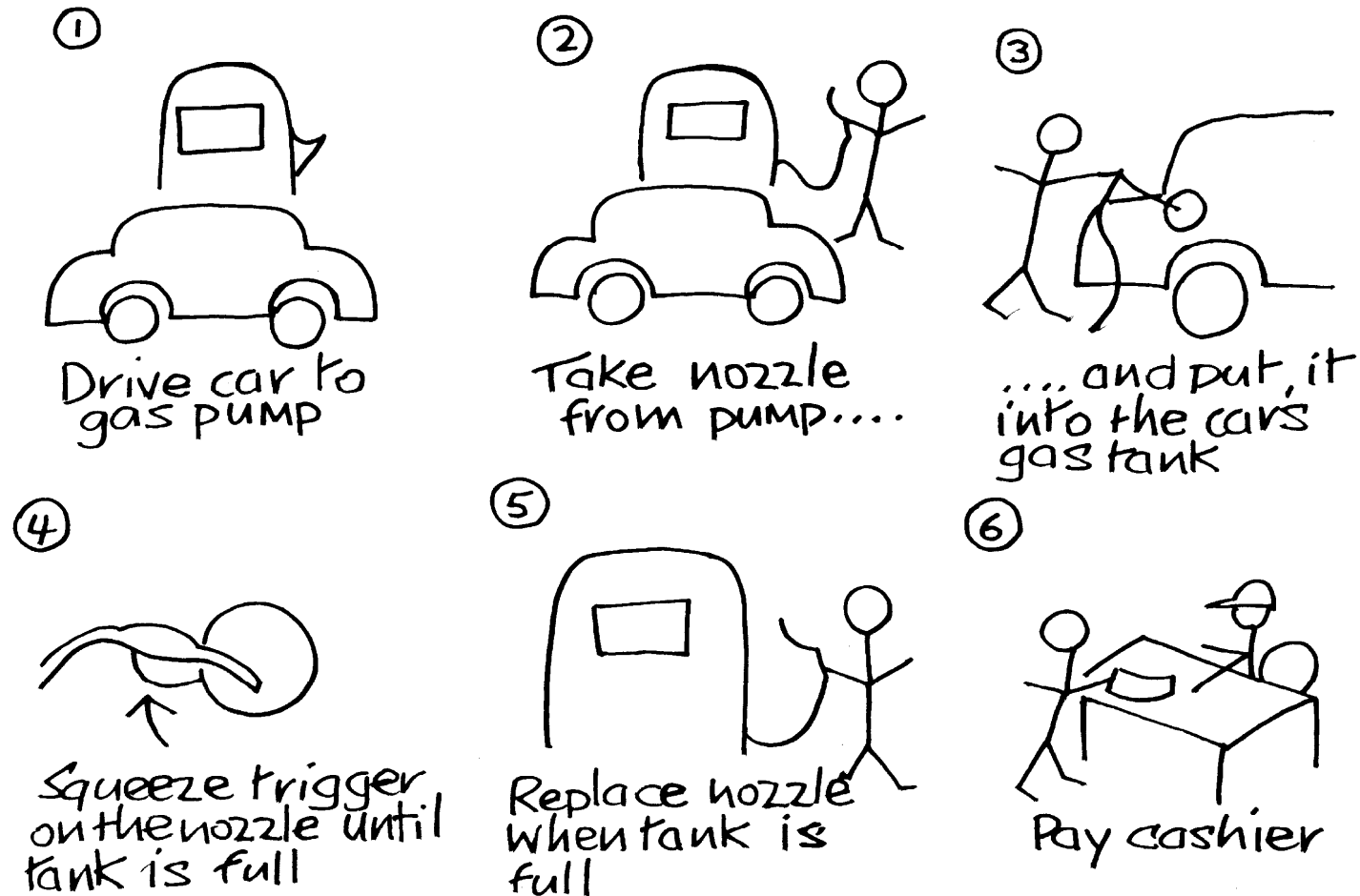
Prototyping Techniques

Storyboards – a **graphical** representation of outward appearance of intended system, without any accompanying system functionality

- Often used with scenarios
- Low-fidelity prototyping and used early in design
- A series of sketches showing how a user might progress through a task using the device being developed

Prototyping Techniques


- e.g., a storyboard depicting how to fill a car with gas



Prototyping Techniques

Card-based

- Index cards (3 X 5 inches)
- Each card represents one screen or part of screen
- Often used in website development


 Travel
Organiser

23 August 2006

Train timetable from Milton Keynes Central
to York
on 16.09.06

Depart	09:09	10:09	same	22:09
Arrive	12:30	13:30	Mins past hour	01:30

Accommodation	Hotel	B&B
	£40 to £150	£20 to £60

 Travel
Organiser

23 August 2006

WELCOME HELEN

Where do you want to go?

What date do you want to travel?

Which form of transport do you want?

Do you need accommodation?

YORK

16/9/06

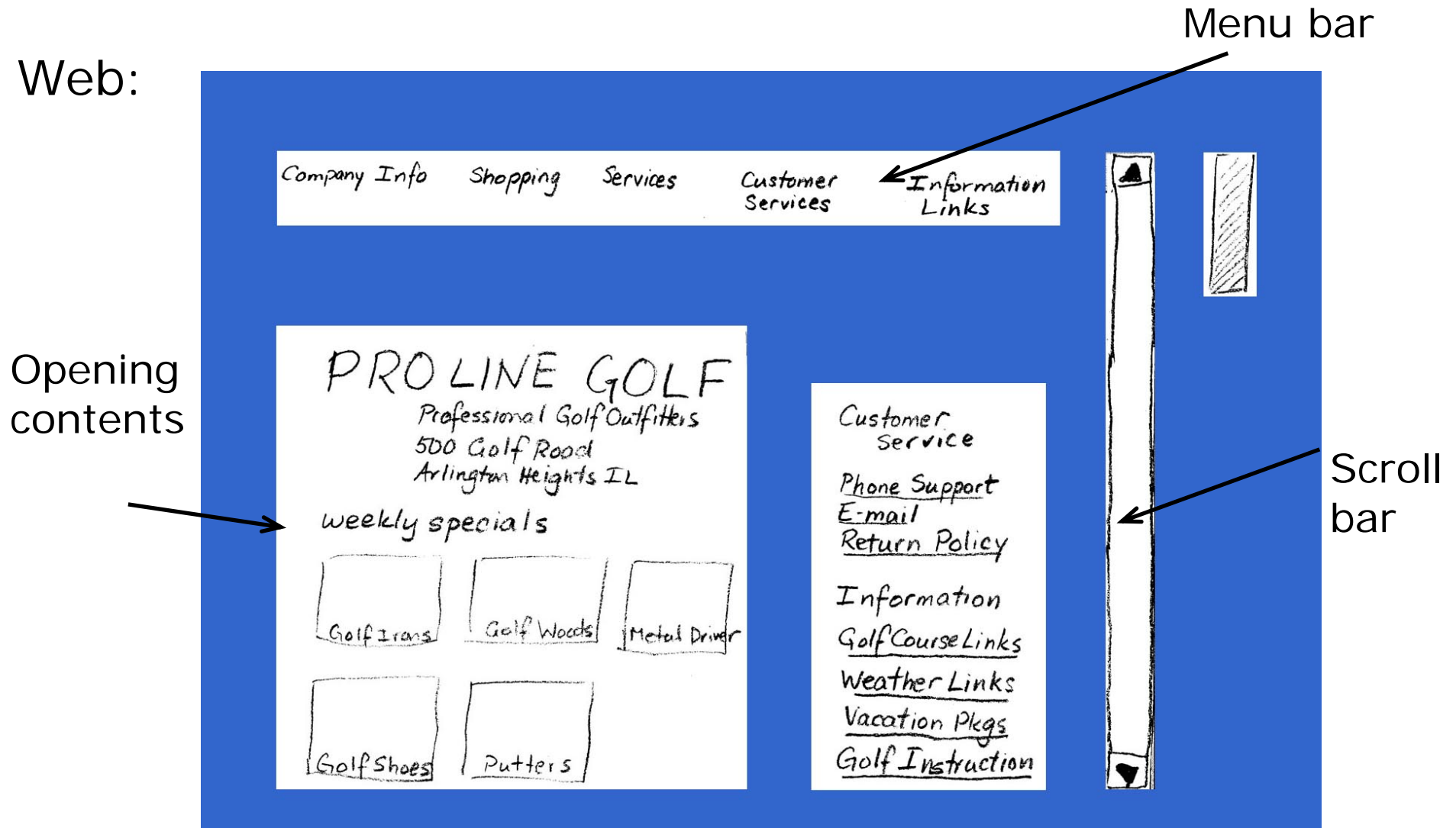
TRAIN ▼

YES ▼

Prototyping Techniques

Paper – also important to low-fidelity prototyping

Web:



Prototyping Techniques

Ashford Charleus, Shahana Dewan, Khairul Kabir, Libai Qu
(Computer Science, Spring 2003, City College of New York)

First level:

Pulldown
menu



Prototyping Techniques

Second level:



Prototyping Techniques

Another second level:



Prototyping Techniques

After prototyping and user testing, this is what their home page looked like:



Prototyping Techniques

Limited functionality simulations – simulate **part** of system functionality provided by designers

- An example of high-fidelity prototyping
- Useful for selling ideas to people and for testing out technical issues

e.g., use Visual Basic to produce a VCR panel on screen; allow people to press mouse button to “experience” its functions