

1 EXPERTS VERSUS NOVICES

- **Novices** – Someone who has little knowledge or experience within a domain
 - Need less information – cues/feedback/integrated feedback
- **Experts** – Someone who has large amount of knowledge and experience within a domain. Based on large/varied knowledge base, stored in the form of schemas, that takes many years to acquire
 - Becoming an expert involves extensive practice.
 - Less information needed, too much information becomes redundant
- **Schema** – Domain specific knowledge structure that allows people to categorize multiple elements of information as single unit
- **Declarative Knowledge** – knowledge about fact or things 例如‘钢琴是一种乐器’
- **Procedure Knowledge** – knowledge about how to perform various actions or cognitive activities. ‘如何弹钢琴’

Three stages in skill acquisition

1. **Cognitive Stage** – fact are learnt, encoding of declarative knowledge
 2. **Associative Stage** – basic procedural
 3. **Autonomous Stage** – procedure become automated and rapid
- Proceduralization refers to the process by which people switch from explicit use of declarative knowledge to direct application of procedural knowledge
 - Three Main body of search
 - **Pattern learning and Memory**
 - Experts can chunk large amounts of meaningful information into single unit, in order to have better memories and meaning patterns
 - Experts have huge domain-specific knowledge base, allows them to recognize large number of familiar patterns/chunks – chunking ability
 - Navigate through a menu system that is deeper
 - Remember the shortcuts
 - Learn to use complicated similar interface quick
 - **Problem representation and categorization**
 - Experts can instantly recognize & categorize problem in terms of its solution
 - “Be careful to create categories that are meaningful to your user group”
 - **Problem Solving Strategies**
 - Experts tend to use schema based strategies to solve problems, usually working forwards from the givens to the goal ⇔ experts can use prior knowledge and schema to easily navigate through the system, lots feedback can cause redundant -> expertise reversal effect
 - Novices tend to use search based strategies, such as means-end analysis, and solve problem from backwards ⇔ they need a lots a meaningful cues and feedback

Intermediates:

- Most users are either experts or novices, because they don’t stay beginner for long, and high level of expertise (to use a system) is unusual
 - Ski-slope analogy
- Goals of design should be
 - Rapidly and painlessly to get beginners to intermediacy
 - Avoid obstacles for intermediates who want to become experts
 - Keep perpetual intermediates happy

Characteristics of Novices:

- They don’t want to remain this way for long, and heed help to go away once redundant
- Need system features that rely on recognition and support learning – menu/prompts/help screens
- Need simple tasks with small number of options and informative feedback

Characteristics of Experts:

- Want fast access to regular tools -> short cuts
- Want powerful features, not bothered by increased complexity
- Expect rapid performance, and rely of free recall – error prevention
- Need less informative feedback, and need efficiency by reducing keystrokes

Characteristics of intermediate users:

- Want access to tools without the explanation of each tool
- Tooltips are useful -> focus on function
- On-line help useful -> they can access it when they need
- Want regularly used functions easily available
- Find it reassuring to know advanced features exists, but rarely use them

Practical Applications of expert/novice differences:

- Software can be designed with different modes or versions for novices and experts
 - E.g. iMovie, Photoshop, Microsoft word short-cuts, different level for games
- Game software often takes level of expertise into account – as level of expertise increase, things speed up. Less cues will be provided
- Expert/novice web users
 - Expert web users are skilled at using search engines & locating information on the web. They don't really need special navigation.
 - Need to teach the novices basic web search skill
 - Increase in difficulty achieved by – making location choices less obvious, not locations to choose from, create complicated instructions, rules, using unfamiliar names/context

2 INTERNATIONALIZATION

What makes differences

- *The character set/keyboard* – different language might have different keyboard and character/words
- *Direction of text/alignment layout* – English and Arabic have different text direction
- *The language/words/phrases/spelling* – make sure not just using translate but ask local experts to see if the translation makes sense, and sometimes direct translate might not be efficient/noticeable to people
- *Size of words* – For the same word/sentences, length/width might be different
- *Sort order* – because of the language is different, different sorting algorithm might be needed
- *Metaphor* – certain metaphor might make sense to some language but not for others
- *Images/icons* – the icon /image to represent things might differ for different countries
- *Date/Time/Currency* – the format of date and time
- *Units of measurement* – temperature, distance
- *Calendars* – some country has their lunar calendar
- *Colors* – different color might have different meaning in different countries/areas

Reasons why internationalization is important

- International sales to other countries can be important, e.g. Europe has a lot of countries with different language and culture
- Local customs/traditions can vary depends on the country
- Length of word can be different, translation might not be accurate enough ⇔ translate might cause interactive mistake (less mistake when test on paper) ⇔ need local expertise who's familiar with local customs and expressions, who has been in the place recent times to provide suggestion
 - Labels/titles/Menu items
 - Error messages/Manuals

Examples

Internationalization & Localization

- **Internationalization** is a process of designing, preparing, developing the application for localization.
- Localization is the processes of adapting an internationalized application to local and cultural conditions
- Internationalization relates to the development of infrastructure that will enable the creation of localized versions
 - Change Infrastructure ⇔ store separate resources in one executable application, to ship with many localizations included
 - Design independently of localization issues, apply individual locations
 - Need to treat the localized versions as a new interface, testing and evaluation needed
 - Start in beginning of the life cycle.
- It involves the specific changes to user interface:
 - Text messages
 - Icons/ Images
 - Sounds/ Media

International Usability Engineering

- Avoid to use complicated language & use examples overly dependent on local culture
- Involve international representatives in product design (early stage)
- Local Viewpoint – many software titles originate from the US, people from different country review different amount of comment per article, e.g. US reviews 0.06 comments per article
- **Graphics**
 - Use the icons that local country uses/familiar with, e.g. Ticks and crosses, mailbox, owl
 - Need test
- **Calendars**
 - 南北半球的 season 季节不相同
 - Gregorian calendar vs Lunar calendar
- **Dates**
 - Different date formats may be used in different area ⇔ solution, use month word instead of number
- **Keyboard Layout**
 - Different language have different keyboard, especially for phone

3 SOCIAL AND COLLABORATIVE COMPUTING

Social Interaction – Human are social creatures because we're sensitive/responsive to social cues:

- "Social interaction is a process by which we act and react to those around us ⇔ people perform towards each other and the responses they give in return."
 - Study of social interaction involves the careful assessment of practices of everyday communication between people in different situation.
- Elements of Social Interaction
 - **Social Context** ⇔ the immediate physical and social setting / situation
 - Family, friends, education, work
 - Social Roles / Status
 - **Social Status** 社会地位 ⇔ relative rank that an individual holds, with attendant rights, duties, and life style, in a social hierarchy based upon honor or prestige
 - Ascribed Status – age/sex/race/family relationship
 - Achieved Status – education/occupation/marital status/accomplishments
 - **Social Roles** 在社会上扮演的角色 ⇔ behaviors expected of people in certain status. Roles help to make the social interaction smooth and possible.
 - Child and parents / student and teachers / shopper and cashier
 - **Social Norms** 社会上不沉稳的规定 ⇔ informal understandings that govern the behavior of members of a society
 - Shaking hands/eye contact with the person you're talking to/avoid racist comments/go to the back of the queue

- **Social Communication** ⇔ communication is the act of conveying meaning from one entity/group to another through the use of mutually understood signs and semantic rules
 - **Verbal** – convey message by using language in different forms. Text/voice/audio visual
 - **Non-Verbal** – convey message through non-linguistic representation. Facial expression/gesture/eye gaze/vocalization/clothing
- **Social Perception** 观察 ⇔ Forming impression about others dispositions and intentions, e.g. emotion/personality/belief/behavior
- **Personal Characteristics** ⇔ our personal and social characteristics, e.g. mood/personality/emotion...
- **Cultural Issues** ⇔ people speak different languages / not all norms are universal / different signals
- Cultural types
 - *High-context*: relies heavily on nonverbal communication and deep cultural knowledge to convey meaning, e.g. Asian countries
 - *Low-context*: depends largely on words themselves, e.g. western countries

Social Computing

- Social Media:
 - Emergence because pervasive computing devices, widespread internet access, portable computing devices, greater need for remote communication and collaboration
- Support social interaction, connect people together, facilitating collaborations, potentially predict social outcomes.
- It's a multi-disciplinary field
 - Computing
 - Social Psychology
 - Communication Science
- Ongoing challenges – understanding the context (share calendar) / understanding roles and status (Facebook friends) / following norms (doctor, patient relationship) / making communication (google home) / reading social cues (emotions, recommender) / understanding social differences
- Solutions
 - Emotion – social cue
 - Natural language processing – communication
 - Hash tag – social context
 - Online/offline status – social norms

Collaborative Computing ⇔ subgroup of social computing (focus on group rather than individual problem solving)

- People can share information without the constraints of space and time
- Facilitate groupwork
- Increase efficiency and productivity
- Support informed decision making
- Benefit:
 - Flexible working time and place
 - Leverage of distributed talents
 - Increasing productivity
- Challenges:
 - Building trust
 - Quality
 - Coordination mechanisms
 - Social translucence / awareness

Crowd Computing ⇔ form of distributed work where tasks that are hard for computers to do, are handled by large number of humans distributed across the internet

- Challenges – cost/participants with different levels of expertise/ erroneous decisions/ speed/ integration of collected knowledge
- Should be able to distribute to sub-problems