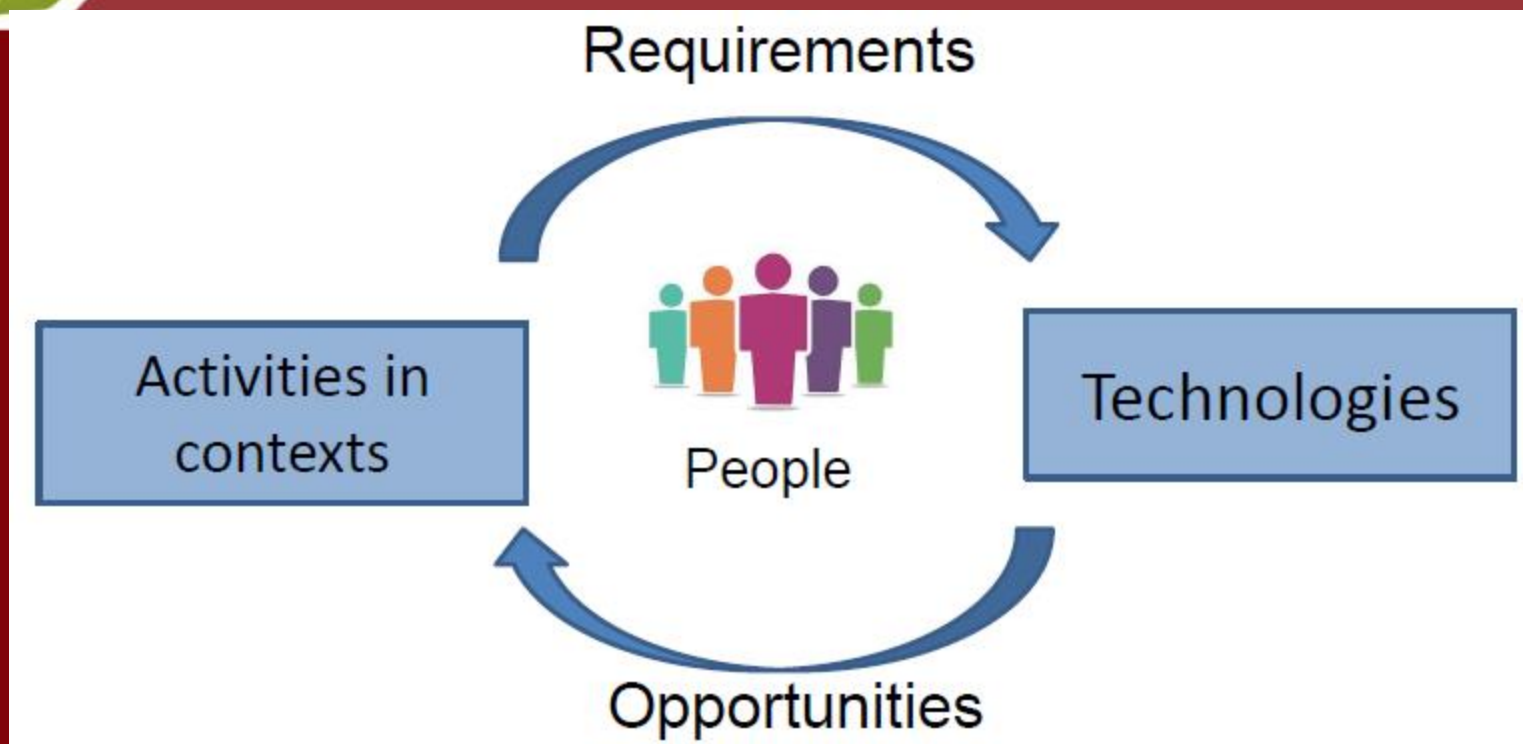


USER RESEARCH





Activities & technology



Diambil dari handout Kristina Lapin, Vilnius University, Faculty of Mathematics and Informatics, Department of Computer Science



PACT FRAMEWORK

PACT
analysis

- **P**eople
- **A**ctivities
- **C**ontext
- **T**echnologies



PACT analysis

- **People**
- Activities
- Context of use
- Technologies

People are the first part in the PACT framework. Since there are so many different types of differences among people these are divided into three different categories; physical differences, psychological differences and usage differences.



PEOPLE

- Physical differences
- Ergonomics
- Psychological differences
- Mental model
- Social differences



Physical Differences

- Physical characteristics: height, weight
- Senses: sight, hearing, touch, smell, taste

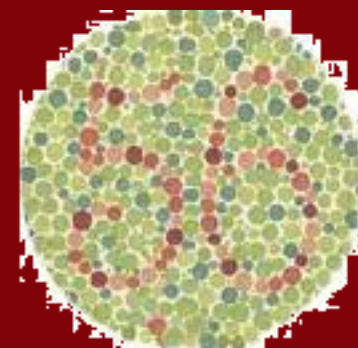
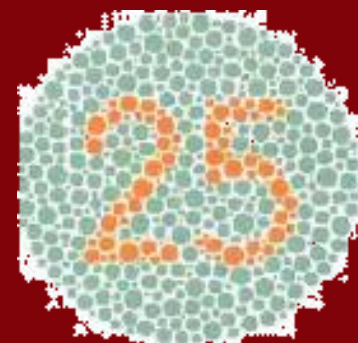


Source of images: [An innocent visit to a Thailand ATM sparks a new meme](#)



Physical Differences

- Colour blindness
 - inability to distinguish red and green colours affects ~8% males
- Short-sightedness, long-sightedness
- Hearing and finger dexterity impairments
- Large fingers vs small buttons





Ergonomics

- an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely (Webster)
- The term was coined in 1948 to describe the study of the relationships between people and their environment.
- •Multidisciplinary discipline includes
 - the working environment
 - safety issues
 - anatomy and physiology
 - psychology



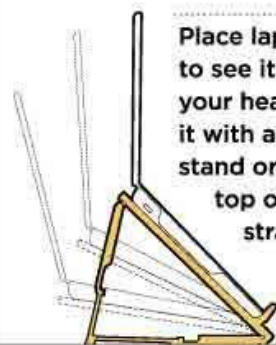
Ergonomically Correct Laptop-using Posture

Laptop Ergonomics for Desk and Travel

Make laptop computing safer and more comfortable with these tips for reducing hassles, hazards and heat buildup.

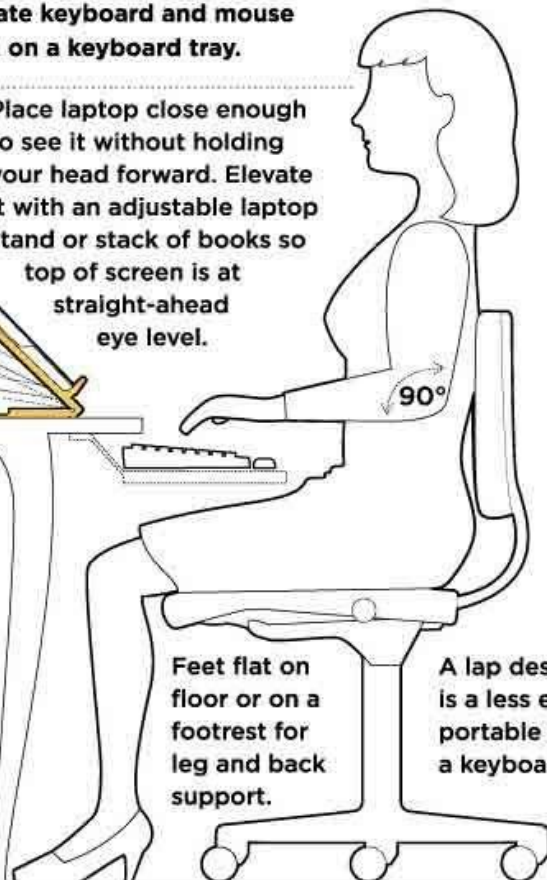
AT WORK OR HOME

Attach a separate keyboard and mouse and place both on a keyboard tray.



Place laptop close enough to see it without holding your head forward. Elevate it with an adjustable laptop stand or stack of books so top of screen is at straight-ahead eye level.

So forearms are parallel to floor, move keyboard tray to elbow height if you look at keys when typing, or one inch below if you don't.



The goal is to relax neck, shoulders, arms and hands when typing and mousing.

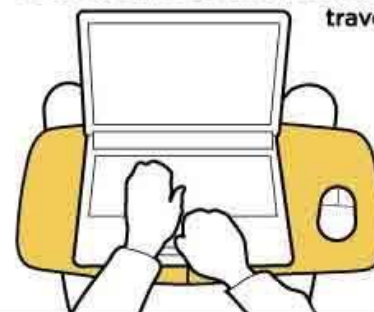
Sit back in chair with head directly over relaxed shoulders. Be sure to support lower back.

Feet flat on floor or on a footrest for leg and back support.

A lap desk across the lap is a less expensive and portable alternative to a keyboard tray.

WHEN TRAVELING & NOT USING DESK

A lightweight lap desk across the knees improves posture, and folds to fit in a laptop backpack for easy traveling.



A wide lap span (20" or more) allows knees to relax, minimizing strain on shoulders, neck, back and arms.

Reduce heat build-up and prevent lap burn with platform that lets heat escape from under computer.



WHEN TRAVELING AND USING A DESK



When a separate keyboard is impractical, a portable stand inclines laptop so arms and elbows hang relaxed at sides to reduce back and shoulder strain.

SOURCED BY SALLY A. LONGYEAR, CIE, MPH (WWW.WORKING-WELL.ORG) AND LAPWORKS (WWW.LAPWORKS.NET)



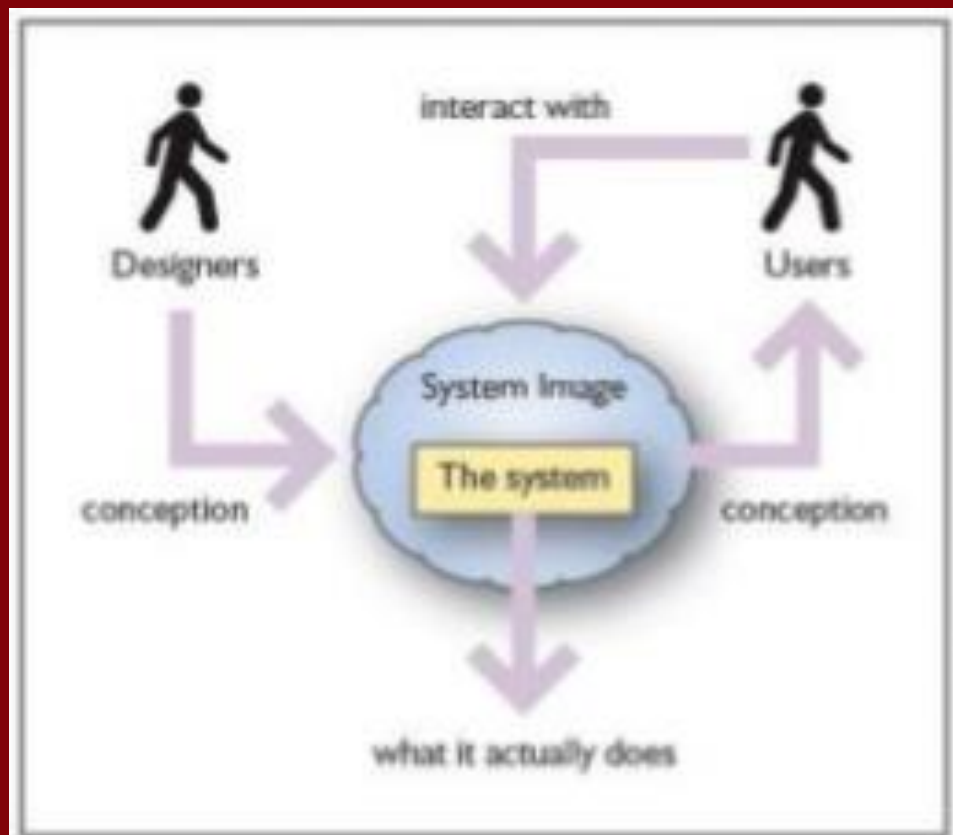
Psychological differences

- Different spatial abilities
 - Good ability help easier navigate in websites
 - Designers should design for people with poor ability
 - Provide good signs and clear directions
 - Language differences
 - Cultural differences



Mental model

- The understanding and knowledge of using IT
 - Incomplete
 - people understand some
 - parts better than others
 - unstable
 - people can forget details
- Develop through interacting with systems



Norman's system image
(Benyon, 2013, p. 31)



Social Differences

- the reason for use technologies
 - The goals and motivations in using technology
- Beginner, intermediate and expert users
- Motivations to learn and use particular system
 - beginner needs to be guided
 - experts use a system regularly and learn all sorts of details
 - intermediate need to remember how to use



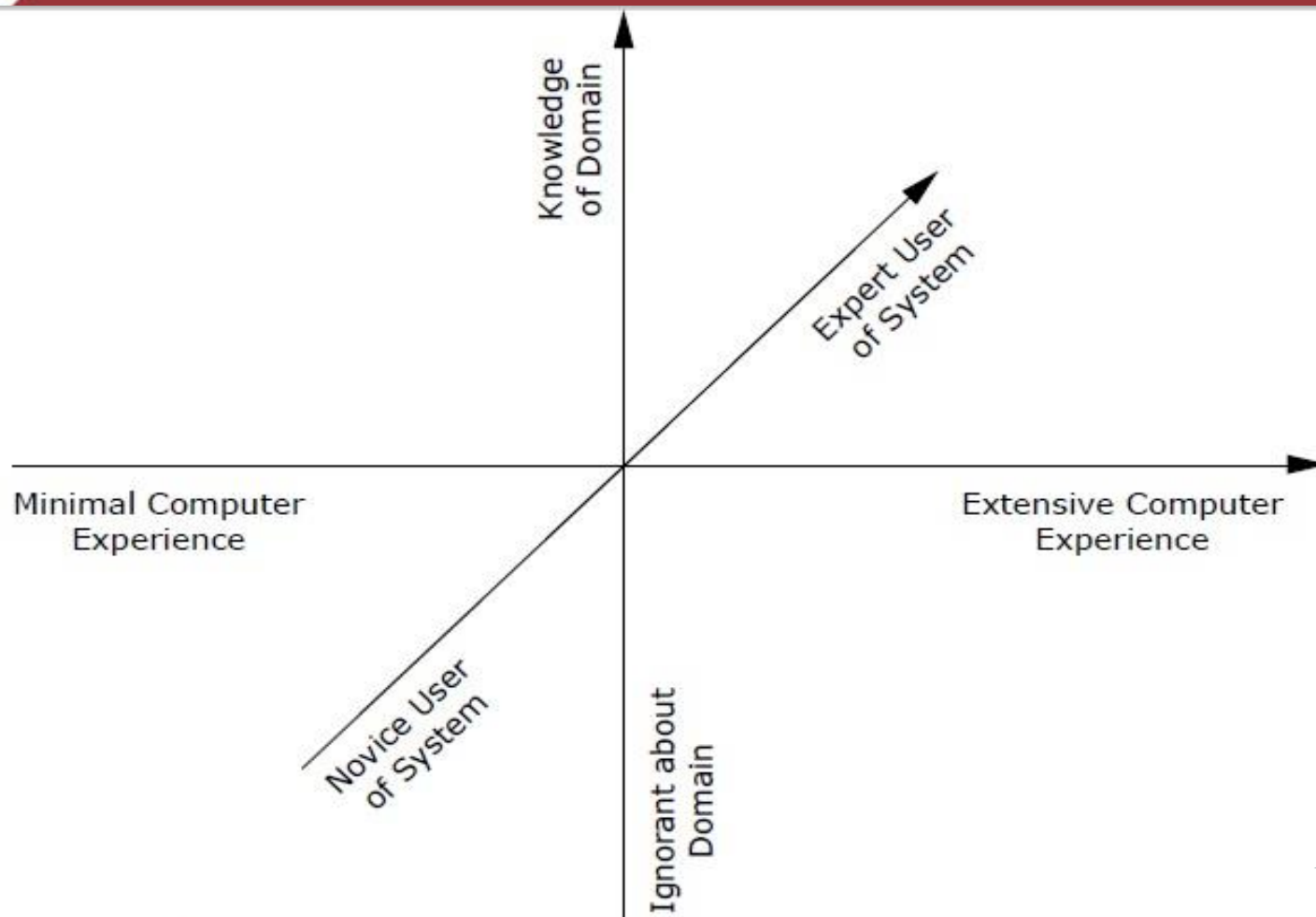
Klasifikasi User

Users can be classified according to their:

- Experience
 - experience of computers in general
 - understanding of the task domain
 - expertise in using the specific system
- educational level
- Age
- amount of prior training, etc



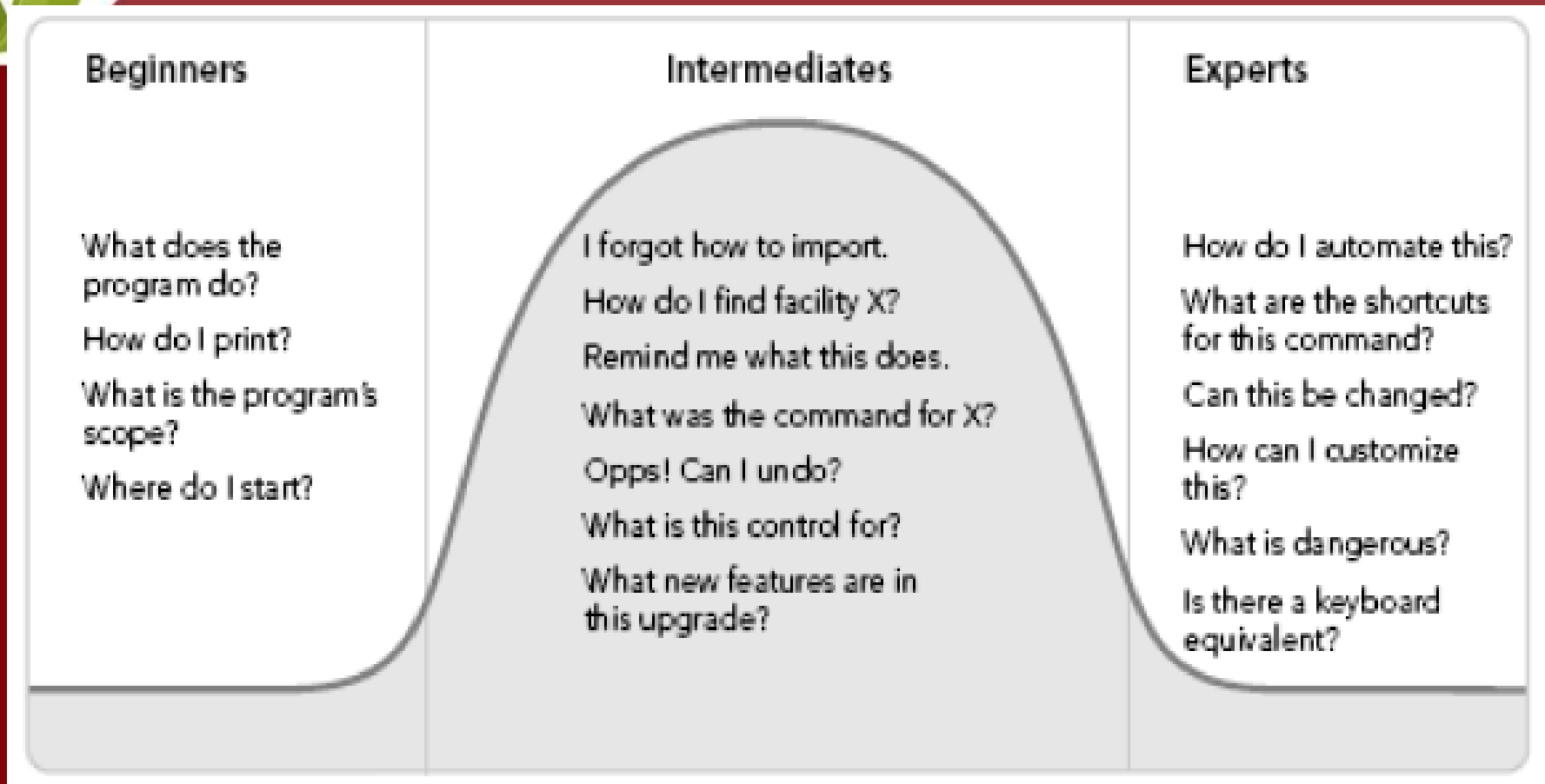
User's Experiences



[Back](#)



User's Experiences



[1] Chapter 3. Beginners, intermediates, experts

[Back](#)



Beginner

- Need extra help for the program until they became intermediates
- They may not recall from use to use exactly which command is needed to act on a particular object,
 - but they will definitely remember the relationships between objects and actions.



Intermediate

- need access to tools.
 - They don't need scope and purpose explained to them because they already know these things
 - tooltips
- know how to use reference materials.
 - They are motivated to dig deeper and learn, as long as they don't have to tackle too much at once



Experts

- demand faster access to their regular working set of tools, which may be quite large.
 - want shortcuts to everything
- seek to learn more and to see more connections between their actions and the product's behavior and representation.
- appreciate new, powerful features.

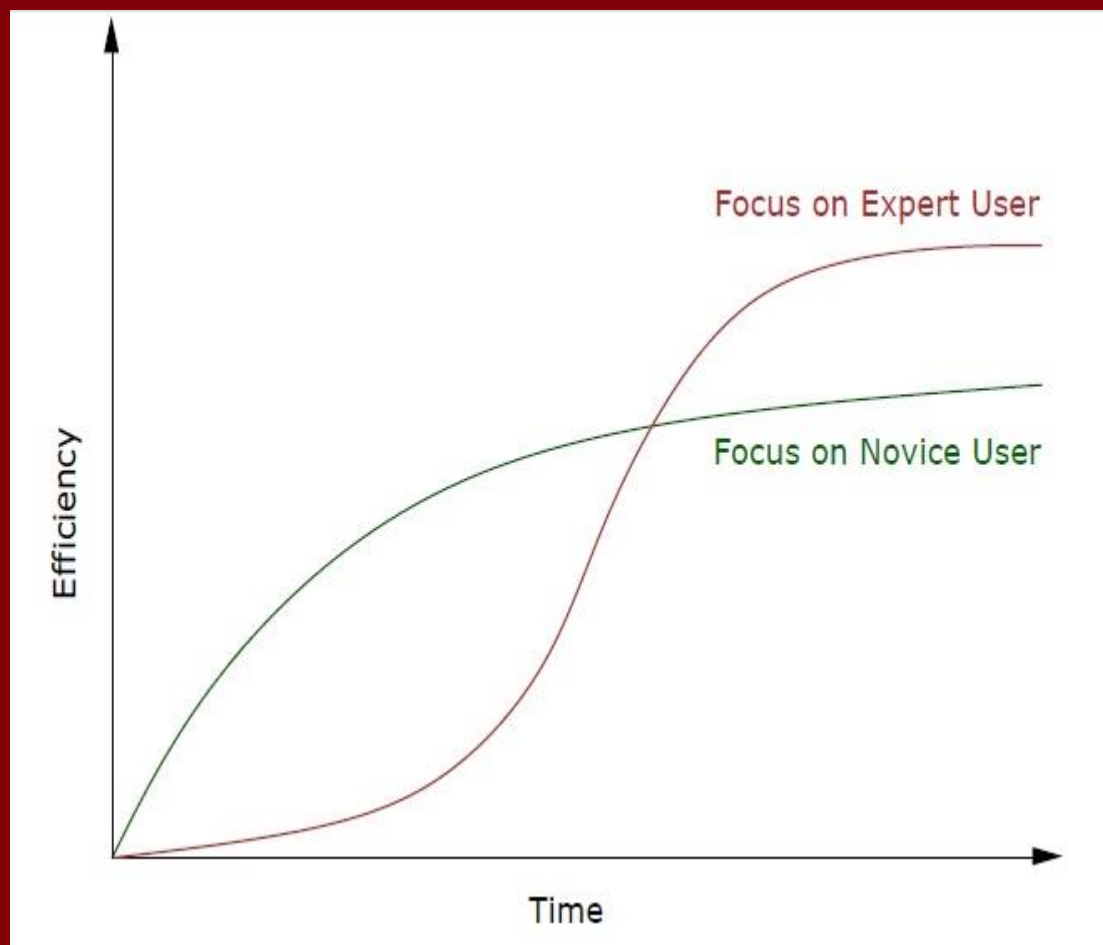


Learning Curves

- Some systems are designed to focus on learnability.
- Others emphasise efficiency for proficient users.
- Some support both ease of learning and an “expert mode” (for example rich menus and dialogues plus a command/scripting language)



Learning Curves



- novice user (easy to learn, but less efficient to use)
- Perpetual Intermediates
- Expert user (harder to learn, but then highly efficient)



PACT analysis

- People
- **Activities**
- Context of use
- Technologies

Activities can be divided into smaller parts such as *temporal aspects, co-operation, complexity, security critical* and the *nature of the content*.



Activities

- Temporal aspects
- Cooperation
- Complexity
- Safety-critical
- The nature of content



Activities

- Temporal aspects
 - frequency
- Frequent tasks – easy to do
- Infrequent tasks – easy to learn or remember how to do
 - Time pressure
- Quiet or busy
 - Single or continuous actions
- Can be interrupted?
 - If Yes – let user find their place
 - Acceptable response time



Activities

- Cooperation
 - One or more users?
 - For collaborative activities
 - Awareness
 - Coordination
 - Communication



Activities

- Complexity
 - Well-defined task
 - can be accomplished by step by step design
 - for a vague activity people have to be able
 - to browse around
 - see different types of information
 - move from one think to another



Activities

- Safety-critical aspects
 - any mistake could result in in an injury or serious accident
 - designers must pay attention to ensuring that mistakes do not have a serious effect
- Designers must
 - think what happens when people make mistakes and errors
 - design for that circumstances



Activities : Content

- Data requirements
 - What is input?
 - large/modest/small amount of required data?
 - How to input?
 - What is output?
 - alphanumerical data, video records, other media
- good content:
 - accurate, up to date, relevant, good presented



PACT analysis

- People
- Activities
- Context of use
- Technologies

There are three types of contexts that can be clearly identifiable; ***social context***, ***organizational context*** and ***physical circumstances*** in which the activity takes place.



The physical context

- Environment in which activity happens
- Physical environment
 - temperature, humidity, atmospheric pressure, lightlevels, noise, ..





Social contexts

- Social environment
 - privat issues
 - individual or group activity





Organisational contexts

- Changes in technologies alter communication and power structures
- Automation can have affects
 - such as deskilling





PACT analysis

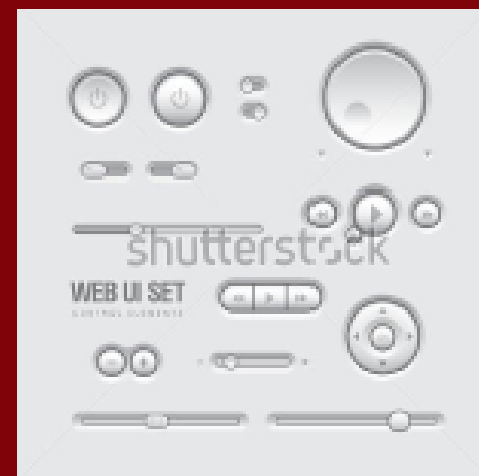
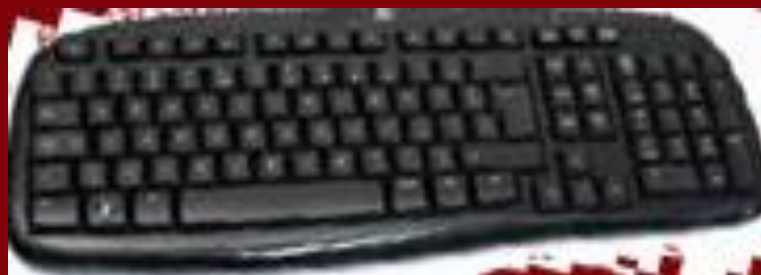
- People
- Activities
- Context of use
- **Technologies**

The last part of the PACT analysis is the technologies part. Technologies in the PACT analysis is divided into four different parts; ***input, output, communication and content.***



Technologies

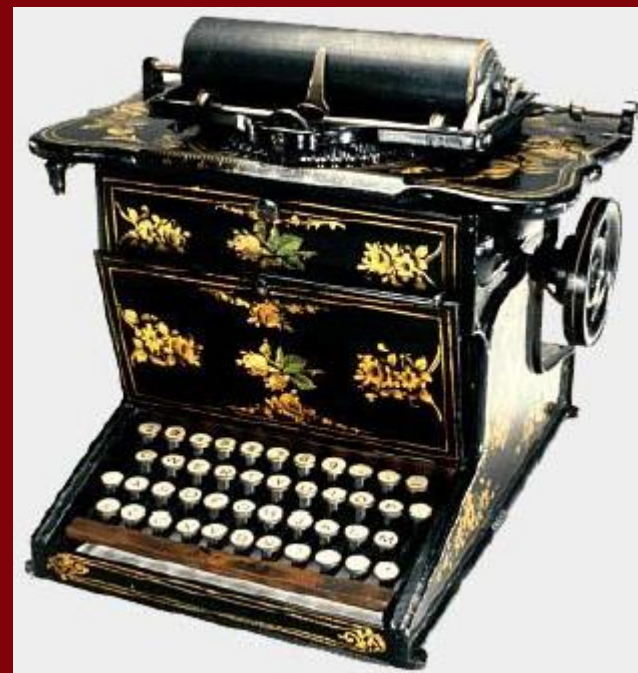
- Input devices
 - switches and buttons facilitate instructions
- take up space
 - for alphanumerical input – keyboards





QWERTY keyboard

- 1868
- Christopher Latham Sholes
- solved the jams when the keys were struck
- 150 words per min





Output technologies



Flexible organic light-emitting diode



2D and 3D printers



Communication

- Between people and between devices
 - Bandwidth and speed are critical
 - Wired with fibre-optic cables
 - The fastest communication
 - Wireless, wifi
 - quite limited in range
 - need to be within a few metres
 - 4G fast and wide coverage
 - Bluetooth, NFC



Content

- Good content
 - accurate, up to date, relevant and well presented
- Characteristics of the data influence input methods
 - Barcodes – for data that does not change often
 - Touchscreens – for a few options to choose from
 - Speech input
 - if there is no noise and few commands to enter



Example: access to university laboratories

- People
 - students, lecturers, technicians
- Activities
 - enter some form of security clearance and open the door
- Contexts
 - indoor activity, people may carry books, in a crowd,
- Technologies
 - small amount of data has to be entered quickly
 - the output must be clear
 - accessible for people in wheelchairs





Research The Frames of Reference

- Tujuan mencari tahu kebutuhan user dalam hal **values, expectations, issues, & constraints**
- Interview dilakukan pada:
 - **Project staff** (managers, programmers, marketing people) who are in charge of developing the software.
 - **Subject matter** and domain experts.
 - **Customers** (the purchaser of the product, not necessarily the same as the end user).



Interviewing Project Staff

- One-on-one interviews.
- Try to discover:
 - vision of the product.
 - budget and schedule.
 - technical constraints.
 - perceptions of who users might be.



Interviewing Subject Matter Experts (SMEs)

- Often hired externally by project manager.
- Provide knowledge of complex domains, regulations, industry best practice.
- Often learn towards expert user perspective (rather than intermediate).



Interviewing Customers

- Customers are the people who make the decision to purchase.
- For consumer products, customers are often the same as users.
- For business settings, customers are rarely actually the users of a product.
- Try to discover the customer's:
 - goals in purchasing the product
 - frustrations with current solutions
 - decision process for purchasing
 - role in installation and maintenance



Research the End User

- The **actual users** of a product should always be the **main focus** of the design effort.
- Most people are incapable of accurately assessing their own behaviour
 - Rather than talk to users about how they think they behave, it is better to observe their behaviour first-hand.
 - And then ask clarifying questions in the context of use.



Ethnographic Interviews

Ethnography → qualitative research

A combination of immersive observation and directed interview techniques.

- Observe the user using their current tools in their normal environment.
- Interviewer assumes the role of an apprentice learning from the master craftsman (user).
- Alternate between observation of work and discussion of its structure and details



Identifying Candidate Users

Designers must capture the range of user behaviours regarding a product.

- What sorts of people might use this product?
- How might their needs vary?
- What ranges of behaviour might be involved?
- Which kinds of environment might be involved?

Try to interview some people from each different group.



Examples

- Whom would you interview if you were designing:
 - An in-flight entertainment system?
 - A corporate help desk?
 - A complete hospital management system?
 - A mobile phone with email capability?



Conducting an Ethnographic Interview

- In actual workplace/environment.
- 45-60 minutes.
- No third parties (supervisors or clients).
- Focus on understanding:
 - Overall goals
 - Current tasks
 - Constraints and exceptions
 - Problems needing solution (where does it hurt?)
 - Broader context
 - Domain issues
 - Vocabulary
- Ask permission to take a few photographs of the user and their workplace (for creating personas).



Patterns of Use

- Business products: Patterns of use are generally based on job responsibilities.
- Consumer products: Patterns of use are generally based on lifestyle (age, gender, occupation, etc).



Being an Active Listener

A good interviewer is an active listener:

- Use open body language: lean forward, hand under chin, arms open, eye contact.
- Use minimal encouragers: brief verbal cues (hmmm, uh-huh, oh?), nodding, tilting head sideways.
- Ask open-ended questions (how, when, what, why) to encourage elaboration.
- Use closed questions (can you, will you, do you) with yes/no or simple fact answer to clarify your understanding.
- Summarise to check you understand the important points: “So it sounds like the key points are...”.



General Flow of Interview for Business Product

- Introductions.
- Why we're here: We've been asked to design/improve X.
- What we'll ask: your day, your background, your frustrations.
- Tell us about your responsibilities and your typical workday.
- Drill into specific tasks.
- How is existing product (if any) involved in those tasks.
- Relationships with other people and processes.
- Goals.
- Follow up on interesting points.
- Wrap-up.



Good General Questions

- What do you spend most of your time on? [task priority]
- What things waste your time? [opportunity]
- Where does it hurt? [opportunity]
- What makes a good work day? A bad one? [goals]
- What kind of training do you have? [support to provide]
- What are the most important things you do? [priorities, goals]
- What information helps you make decisions? [info to provide]

