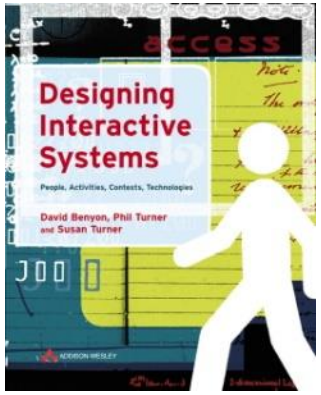
PACT analysis

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



Interactive system design

Dr Kristina Lapin

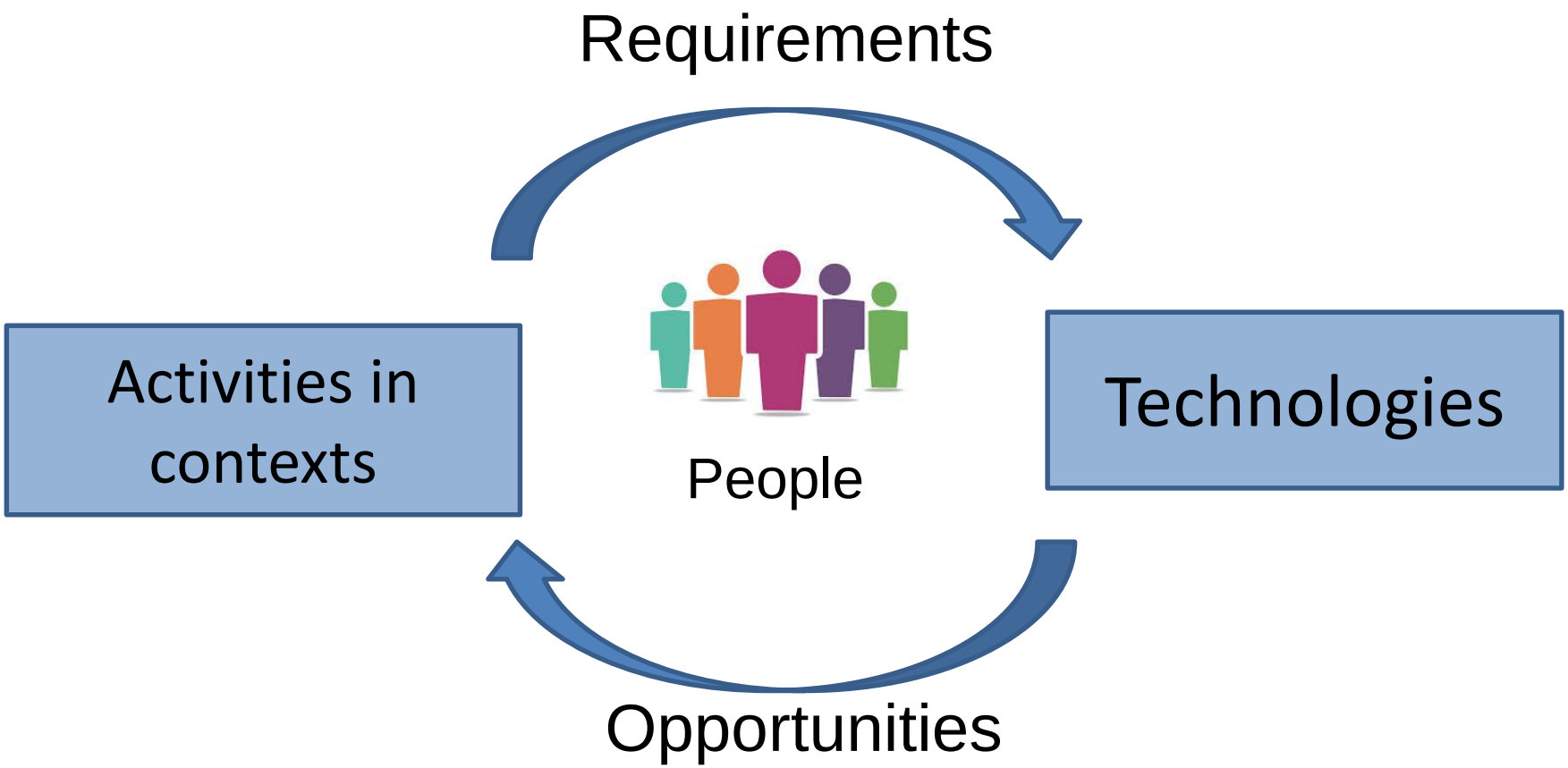
2 lecture

Human Computer Interaction

Aims

- Activities and technologies
- The main characteristics of people
  - relevant to designing interactive systems
- The main issues of activities
  - and the contexts in which they occur
- The key features of interactive technologies

Activities and technologies

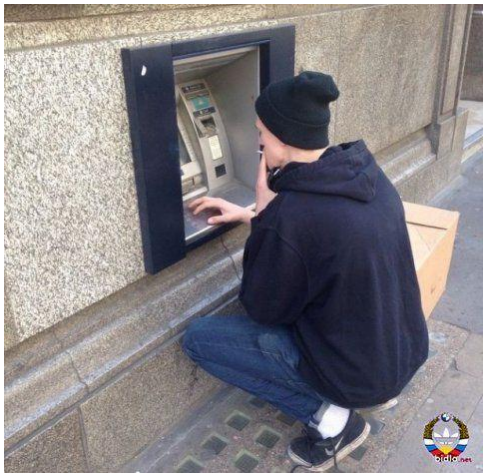


PACT analysis

- **P**eople
- **A**ctivities
- Context of use
- **T**echnologies

Physical differences

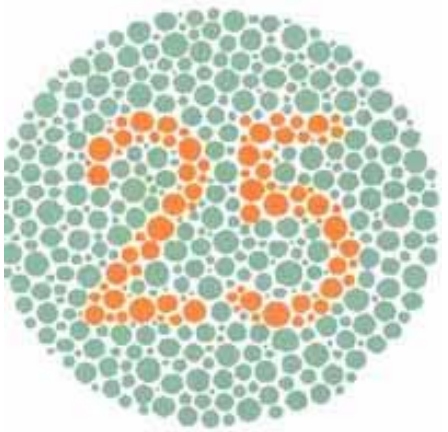
- Physical characteristics: height, weight
- Senses: sight, hearing, touch, smell, taste

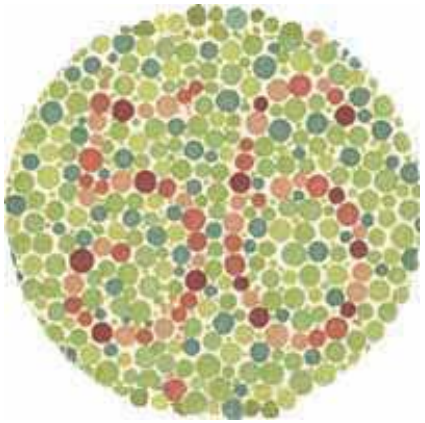


Source of images: [An innocent visit to a Thailand ATM sparks a new meme]

Physical differences

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





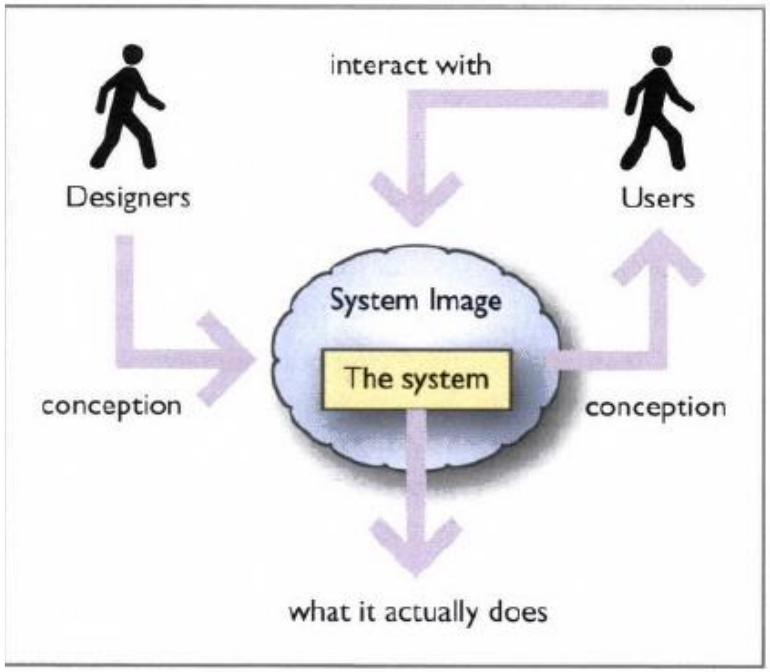
Ergonomics

- 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

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



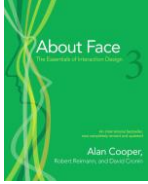
Norman's system image
(Benyon, 2013, p. 31)

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

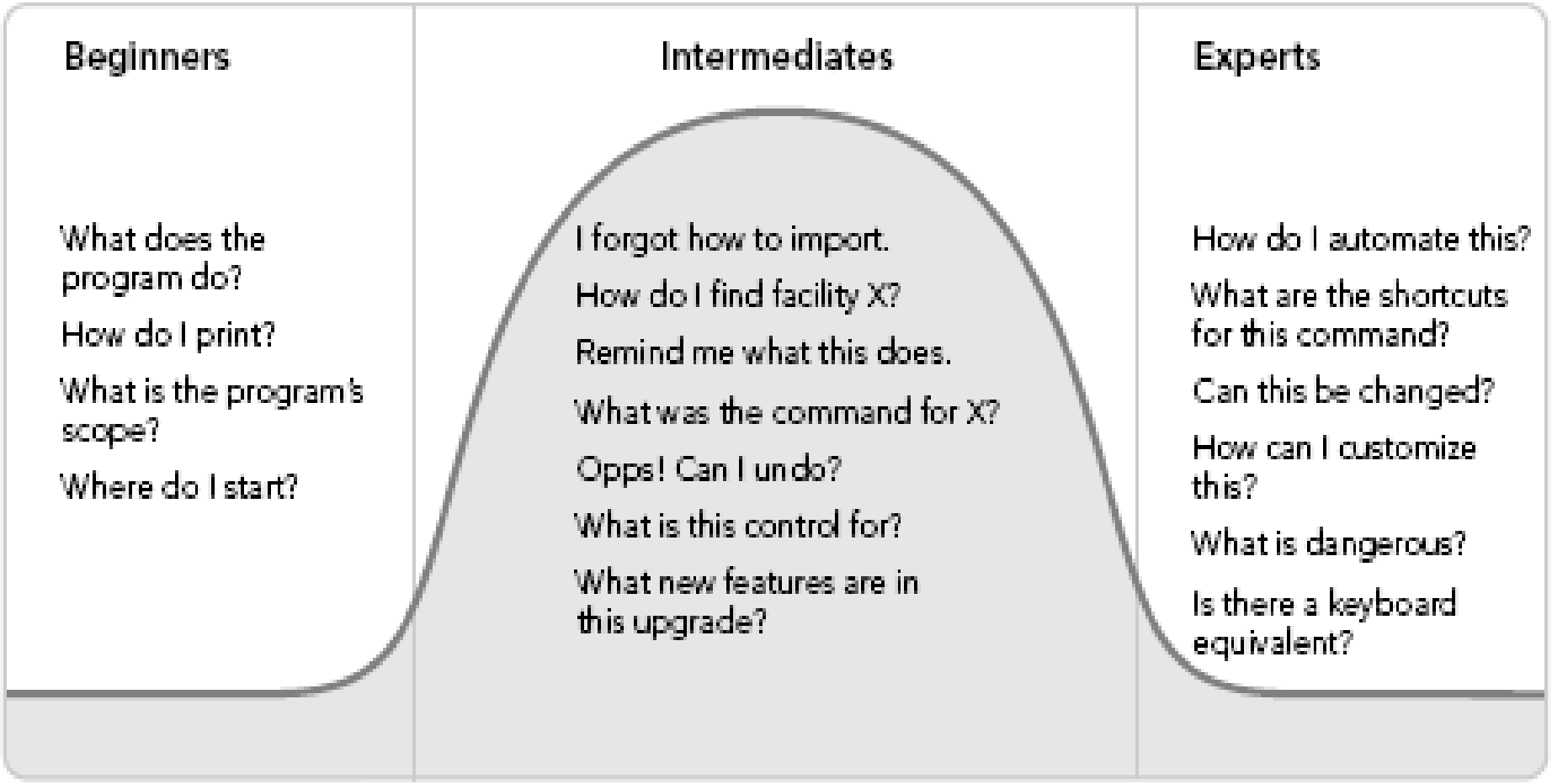
Social differences

- 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

USER NEEDS ANALYSIS: PERSONAS AND SCENARIOS



Different experience levels



[1] Chapter 3. Beginners, intermediates, experts

Beginners

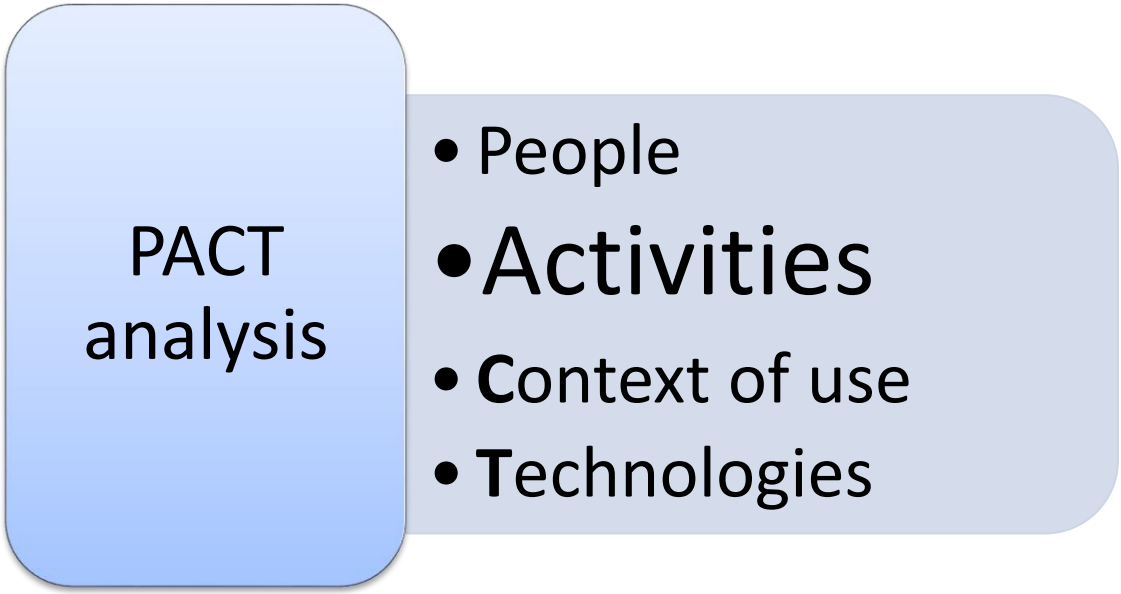
- Need extra help fro the program until they became intermediates
- They may not recall from use to use exactly which command is needed to act on a particular object,
  - but they will definitely remember the relationships between objects and actions.

Intermediates

- 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.


PACT analysis
• People
• Activities
• Context of use
• Technologies

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

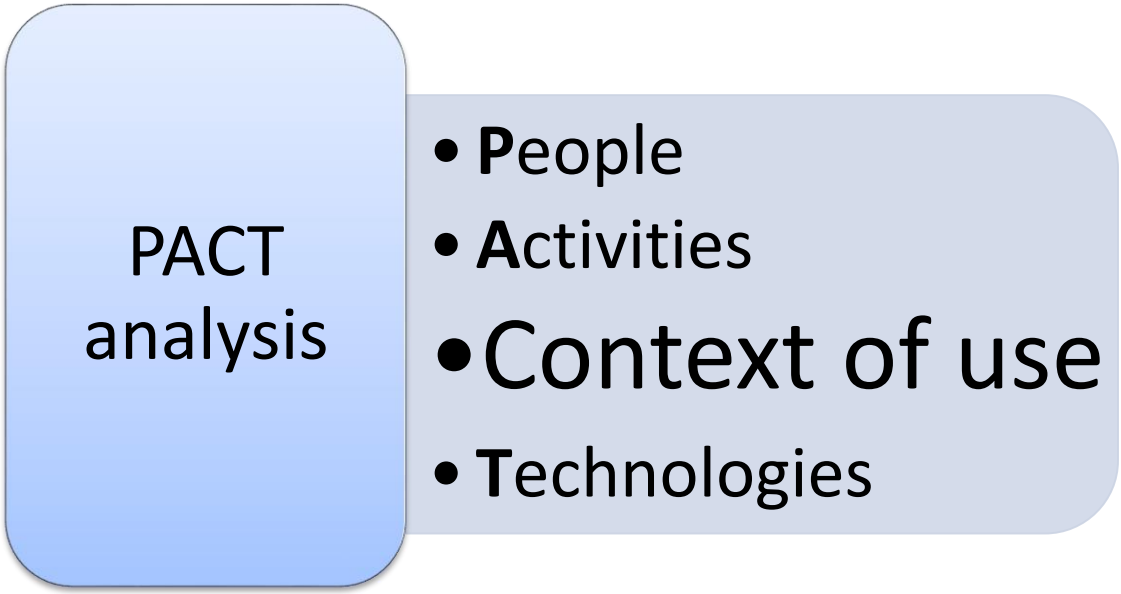
- Complexity
  - Well-defined task
    - can be accomplished by steo by step design
  - for a vague activity people have to be able
    - to browse around
    - see different types of information
    - move from one think to another
    - …

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
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The physical context

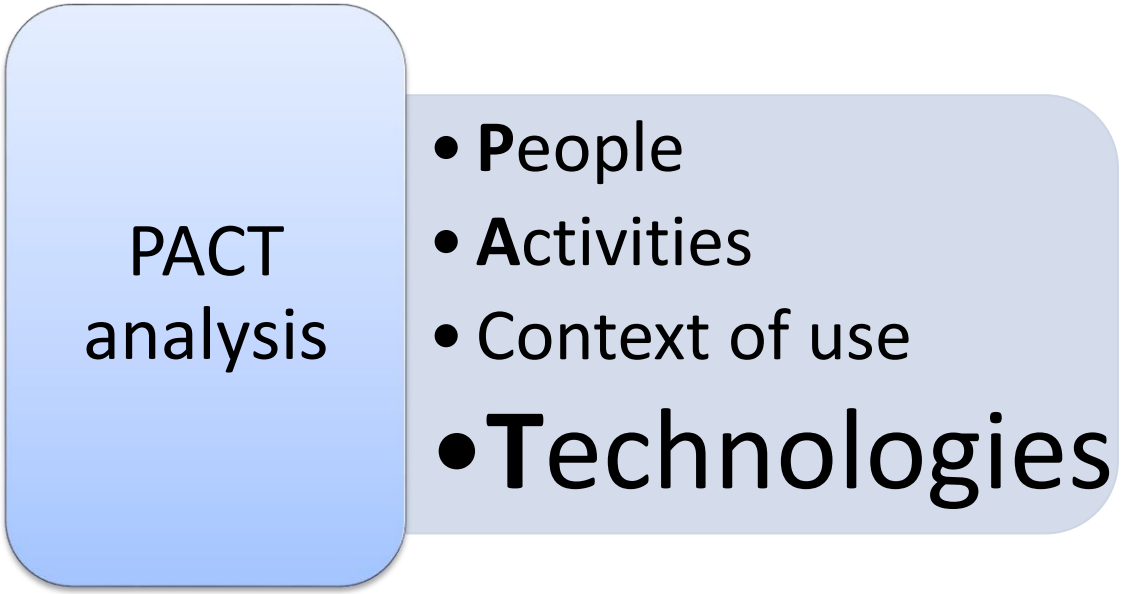
- Environment in which activity happens
- Physical environment
  - temperature, humidity, atmospheric pressure, lightlevels, noise, ..

Social contexts

- Social environment
  - privat issues
  - individual or group activity

Organisational contexts

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


PACT analysis
• People
• Activities
• Context of use
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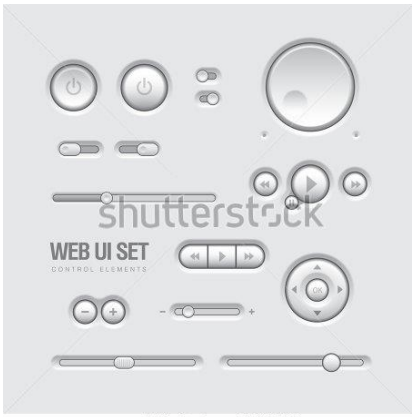
Technologies

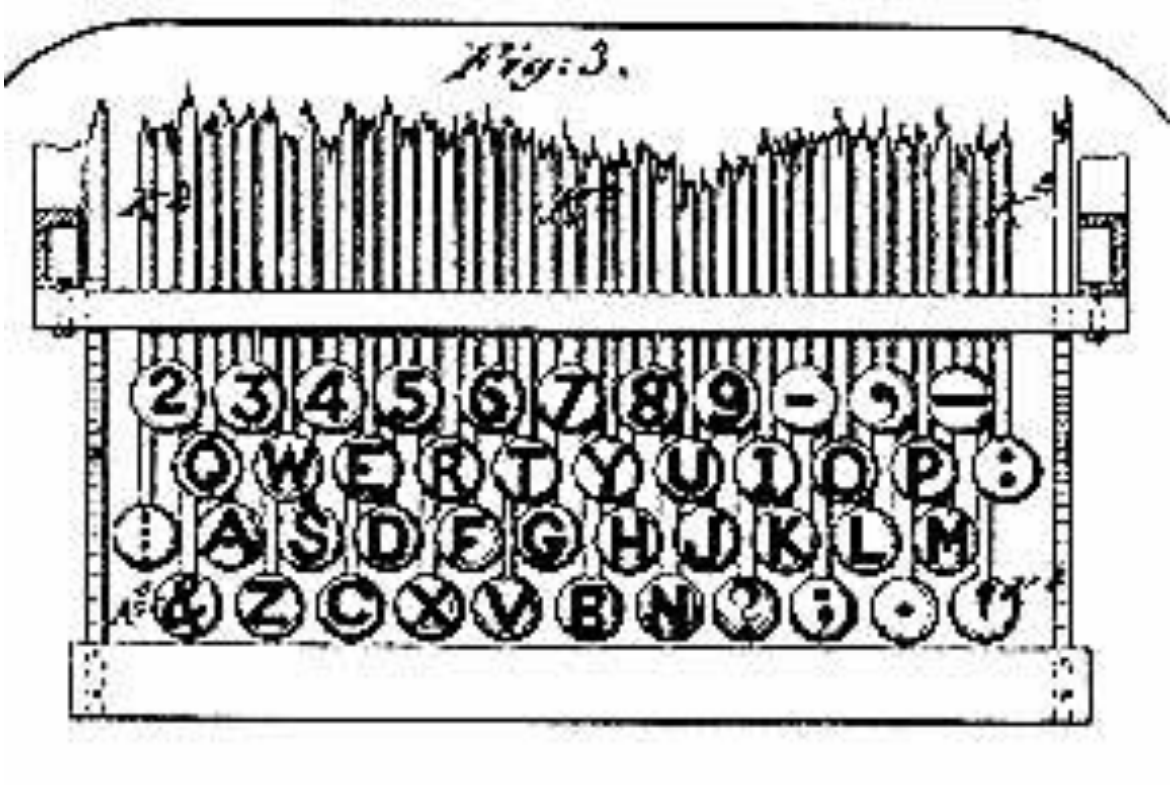
- Input devices
  - switches and buttons facilitate instructions
    - take up space
  - for alphanumerical input – keyboards



QWERTY keyboard

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

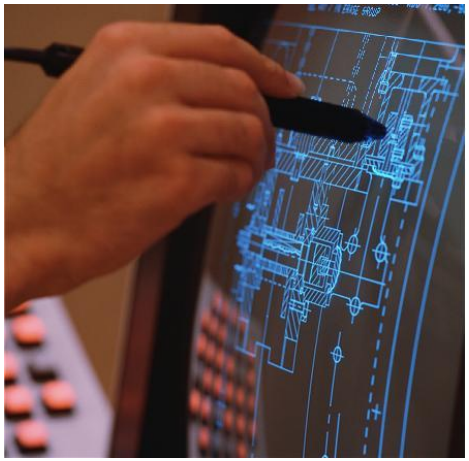
QWERTY layout



Without SHIFT

Technologies

- Input devices
  - touch screens
  - pointing devices, e.g. mouse, stylus
  - trackball
  - joystick



Microsoft surface

Technologies

- Input devices
  - gestures
  - QR codes

Microsoft Kinnect

Output technologies

Flexible organic light-emitting diode

2D and 3D printers

Haptic technologies

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

Scoping the problem with PACT

- Right mix
  - of technologies
  - to support activities
  - being undertaken by people
  - in different contexts

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

Summary

- People: physical, psychological and usage
- Activities: temporal, cooperation, complexity, safety-critical, content
- Contexts: physical, social, organizational
- Technologies: input, output, communication and content
- Undertaking a PACT analysis of a situation is a useful way of scoping a design problem.

Readings

- David Benyon, Phil Turner, Susan Turner. **Designing Interactive Systems: People, Activities, Contexts, Technologies.** Addison Wesley, 2005, 2014.
  chapter 2: PACT framework
- Preece, Rogers, Sharp. Interaction Design: Beyond HumanžComputer Interaction, Wiley.
  Chapter 1. Good and poor design.