

PACT ANALYSIS

Sub Topics

1. PACT Framework for design feasibility

2. PACT component

2.1. People

2.2. Activities

2.3. Context

2.4. Technologies

1.

PACT FRAMEWORK FOR DESIGN FEASIBILITY

What Designers need to concern?

- An essential part of the design approach is to “**put people first**” (“be people-centered”)
- Analyze the proposed product with respect to people and how they will use it
- Designers need to understand/concern followings in advance
 - people who will use their systems and products
 - activities that people want to undertake
 - contexts in which those activities take place
 - features of interactive technologies
 - way to approach designing interactive systems

PACT Framework

PACT (People, Activities, Contexts, Technologies) is a useful framework for thinking about a design of a proposed product in different aspects.

People use technologies to undertake activities in contexts.

Example:

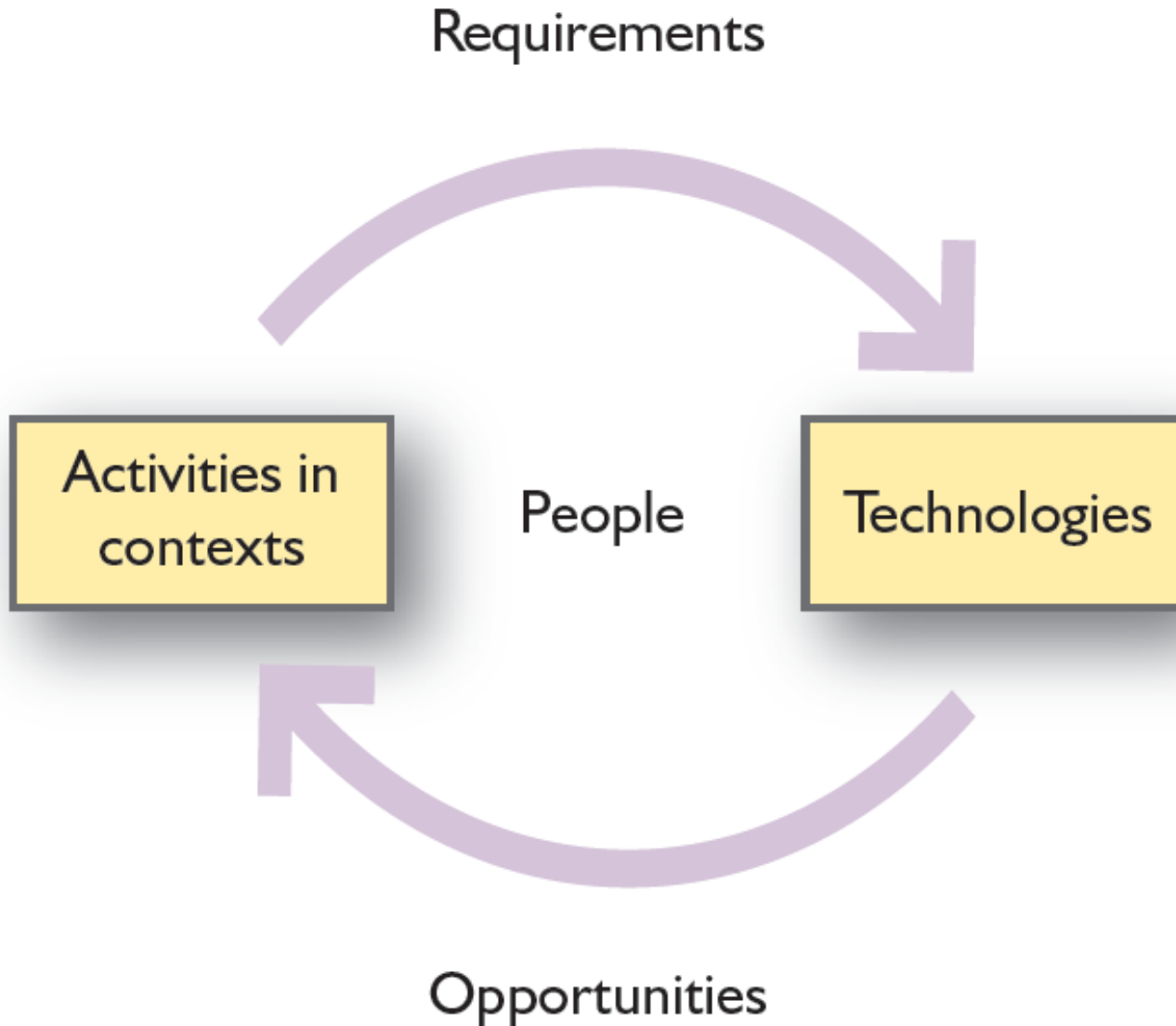
You may use a phone to talk to a friend to inform about something

- Consider Situation 1 - at Home (land phone, speak loudly, may take more time,)
- Consider Situation 2 - traveling in public transport (mobile phone, speak softly, if sensitive will excuse,)

Activities and Technologies

- Technologies are there to support a wide range of people undertaking various activities in different contexts.
 - Same activity is provided in different technologies in different ways
- If the technology is changed then the nature of the activities will also change.
 - Camera phone and mobile upload
- Activities (and the contexts within which they take place) establish requirements for technologies that in turn offer opportunities that change the nature of activities.
 - Taking photos from mobile

Cyclic Relationships between technology and activities



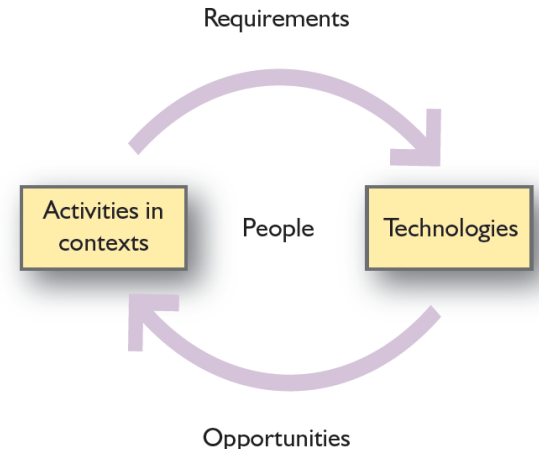
The Cycle continues

the cycle continues as the changed activity results in new requirements for technologies and so on.

Need to keep this cycle in mind as designers attempt to understand & design for some domain.

Eg: As personal computers have become more common, the domain of e-mail has changed.

- Originally e-mail was all in text only.
- Now it is in full color with pictures, emojis, and video embedded.
- Other items can be attached to e-mails easily.
- Emails could be tagged with respect to time, location, people, activities,



PACT Analysis

- PACT framework help to carry out the PACT analysis methodically
- Facilitate the designers to understand many aspects before rushing to a particular design
- Help to select the most suitable alternative design
- Develop successful products

2. PACT COMPONENT

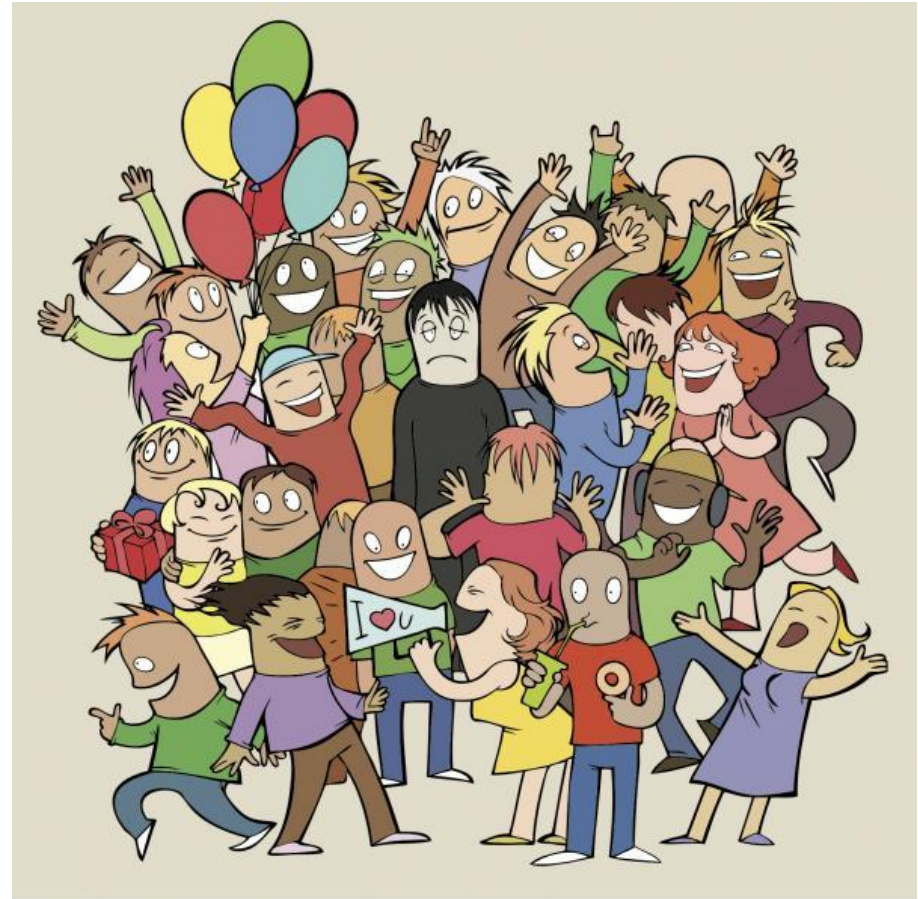
2.1.

PACT COMPONENT: PEOPLE

People

People differ from one another in a variety of ways.

- Physical differences
- Psychological differences
- Social Differences



People - Physical differences

Physical differences have a huge effect on **how accessible**, **how usable** and **how enjoyable** using a technology will be for people in different contexts.

- Main Physical characteristics such as height and weight
- Variability in the five senses -
 - sight
 - hearing
 - touch
 - smell
 - taste



People - Psychological differences

- Psychologically, people differ in a variety of ways.
- *For example*, people with good spatial ability will find it much easier to find their way around and remember than those with poor ability.
- Designers should design for people with poor ability by providing good signage and clear directions.



People - Psychological differences

There are often large differences in the psychological abilities of people.

- Some people have a good memory, others less.
- Some people can find their way around environments better than others, or mentally rotate objects more quickly and accurately.
- Some are good at words, others are good at numbers.
- There are differences in personality, emotional make-up, and ability to work under stress.



Psychological tests

- Many tests have been designed to measure these differences.
 - For example
 - The Myers-Brigg Type Indicator is a series of tests that results in people being classified as one of 16 personality types
- <http://www.16personalities.com/free-personality-test>
- Designers need to consider the range of differences between people, and the demands that their designs make on people's psychological abilities.

People - Social differences

- People make use of systems, products and services for very different reasons.
- They have different goals in using systems.
- They have different motivations for using systems.
- Some people will be very interested in a particular system, others will just want to get a simple task completed.
- These motivations change at different times.
- e.g. Two people may use a smart phone in two different ways

Novice and experts

- Novice and expert users of a technology will typically have very different levels of knowledge and hence requirements for design features.
- **Experts** use a system regularly and learn all sorts of details, whereas a **beginner** will need to be guided through an interaction.
- There are also people who do not have to use a system, but the designer would like to experiment the system with them. These people are often quickly put off if things are difficult to do.
 - Designers need to tempt these people to use their systems.

Similarity between people

- Designing for homogeneous groups of people (groups who are broadly similar and want to do much the same things) is quite different from designing for heterogeneous groups.
- Websites have to cater for heterogeneous groups and have particular design concerns as a result.

2.2.

PACT COMPONENT: ACTIVITIES

Activities and their Characteristics

- An activity will be a series of actions the user may carry out in order to achieve a particular objective.
- A task may consists of several activities. Some tasks will be simple, others will be complex.
- Designer should assess these activities with respect to different characteristics to understand them.
- The main features of activities are:
 - Temporal aspects
 - Cooperation
 - Complexity
 - Safety-critical
 - The nature of the content

Temporal aspects of activities

- Temporal aspects covers how regular or infrequent activities are.
- Something that is undertaken every day can have a very different design from something that happens only once a year.
- E.g. People will quickly learn how to make calls using a mobile phones, but may have great difficulties when it comes to using advanced features.
- Designers should ensure that frequent tasks are easy to do, but they also need to ensure that infrequent tasks are easy to learn (or remember) how to do.

More about temporal aspects

- If people are interrupted when undertaking some activity, the design needs to ensure that they can '*find their place*' again and pick up.
- It is important to ensure that people do not make mistakes or leave important steps out of some activity.
- The response time needed from the system must be considered.
- As a general rule people expect a response time of about
 - 100 milliseconds for hand-eye coordination activities
 - one second for a cause-effect relationship such as clicking a button and something happening.
 - **Anything more than 5 seconds will make them feel frustrated and confused** (Dix, 2003).

Cooperative or complex activities

- Another important feature of activities is **whether they can be carried out alone or whether they are essentially concerned with working with others.**
- Issues of awareness of others and communication and coordination then become important.
- Well-defined tasks need different designs from more vague tasks.
- If a task or activity is well defined, it can be accomplished with a simple step-by-step design.
- A vague activity means that people have to be able to
 - browse around
 - see different types of information
 - move from one thing to another and so on.

Safety-critical activities

- Some activities are ‘safety-critical’, in which any mistake could result in an injury or a serious accident. Others are less so.
- Clearly where safety is involved designers must pay every attention to ensuring mistakes do not have a serious effect.
- In general, it is vital for designers to think about what happens when people make mistakes and errors and to design for such circumstances.

Nature of the content : data and media requirements

- It is also important to consider the data requirements of the activity.
- If large amounts of alphabetic data have to be input as part of the activity (recording names and addresses) then a keyboard is almost certainly needed.
- In other activities there may be a need to display video or high quality color graphic displays.
- Some activities, however, require very modest amounts of data, or data that does not change frequently and can make use of other technologies.
 - A library, for example, just needs to scan in a bar code or two, so the technology can be designed to exploit this feature of the activity.

2.3.

PACT COMPONENT: CONTEXT

Contexts

- Activities always happen in a context, so there is a need to analyze the two together.
- **Three useful types of context are distinguishable:**
 - the organizational context
 - the social context
 - the physical circumstances under which the activity takes place
- Context can be a difficult term
 - Sometimes, it is useful to see context as surrounding an activity.
 - At other times, it can be seen as the features that glue some activities together into a coherent whole.

Example “Withdraw cash from an ATM”

- The **physical analysis** of context would include
 - the location of the device (often as a ‘hole-in-the-wall’),
 - the effect of sunshine on the readability of the display,
 - security considerations.
- **Social considerations** would include
 - the time spent on a transaction or the need to queue.
- **The organizational context**
 - the impact on the bank’s ways of working and its relationships with its customers.
- It is important to consider the range of contexts and environments in which activities could take place.

2.4.

PACT COMPONENT: TECHNOLOGIES

Technologies

- Interactive systems typically consist of hardware and software components that communicate with one another and transform some input data into some output data.
- Designers of interactive systems need to understand the materials they work with just as designers in other areas of design such as interior design, jewelry design, etc.

Classifying Technologies

- Interactive technologies change with all new development.
- Therefore, it is very difficult to classify technologies as they are continually being packaged in new ways and different combinations facilitate quite different types of interactions.
- Designers need to be aware of various possibilities for
 - input
 - output
 - communication
 - content
- E.g. The multi-touch screen on an iPod Touch allows for quite different ways of navigating through the music collection and selecting particular tracks than the track wheel on an iPod Nano.

Scoping a problem with PACT

- The aim of human-centered interactive systems design is to **arrive at the best combination of the PACT elements** with respect to a particular domain.
- Designers want to get the **right mix of technologies** to **support the activities** being **undertaken by people** in **different contexts**.
- A PACT analysis is useful for both analysis and design activities:
 - understanding the current situation
 - seeing where possible improvements can be made
 - envisioning future situations

PACT Analysis - way to do it

- To do a PACT analysis the designer simply scopes out the variety of Ps, As, Cs and Ts that are possible, or likely, in a domain.
- This can be done using brainstorming and other techniques and by working with people through observations, interviews and workshops.
- The designer should look for trade-offs between combinations of PACT and think about how these might affect design.

Designer consideration for PACT

- It is most important that designers **consider all the various stakeholders in a project.**
- **For people**, designers need to think about the **physical, psychological, and social differences** and how those differences change in different circumstances and over time.
- **For activities**, they need to think about the **complexity of the activity** (focused or vague, simple or difficult, few steps or many), the **temporal features** (frequency, peaks, continuous or interruptible), **cooperative features** and the **nature of the data.**
- **For contexts** they need to think about the **physical, social and organizational setting**
- **For technologies** they need to concentrate on **input, output, communication and content.**

Summary

- The design of interactive systems is concerned with people, the activities they are undertaking, the contexts of those activities and the technologies that are used; the PACT elements.
- There is considerable variety in each of these and it is this variety - and all the different combinations that can occur - that makes the design of interactive systems so fascinating.
- People vary in terms of physical characteristics, psychological differences and in their usage of systems (social differences).
- Activities vary in terms of temporal aspects, whether they involve cooperation, complexity, whether they are safety-critical, and the nature of the content they require
- Contexts vary in terms of physical, social, organizational settings.
- Technologies vary in terms of the input, output, communication and content that they support.
- Undertaking a PACT analysis of a situation is a useful way of scoping a design problem.

Exercise

As a member of a company which builds gesture-based interaction systems, you are asked to conduct a PACT analysis for the following scenario. Read the following scenario identify Ps, As, Cs and Ts that are possible, or likely, in this domain.

Ainsoft is a company which builds gesture-based interaction systems. Ainsoft is thinking of incorporating older age users (40-60) to use its gesture-based interaction system which is similar to Kinect. The company is thinking of either building games or introducing related applications (e.g. work calendar, fitness, iTV etc) for target users, which they will be able to use at home.

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