The Human Factor (THF)

Week 3: Socio-Technical Systems and Social Factors

Dr Tara Capel and Dr Uta Hinrichs

THE UNIVERSITY of EDINBURGH

Week 3 Outline

- Socio-technical systems and social factors
- General implications for system design
- Activities:
  - Activity 1: Create a rich picture
  - Activity 2: Continue to work on say method - add questions that consider social context
- Further reading:
  - Foundations for Designing User-Centered Systems textbook by Frank Ritter, Gordon Baxter and Elizabeth Churchill
    - Social: Social Cognition and Teamwork
    - Social: Theories and Models

Socio-Technical Systems and Social Factors

Socio-Technical Systems and Social Factors

- All technology is part of a socio-technical system
- The technology and social system are interdependent and interact
- Understanding the role of social factors is essential for creating technology that is not only usable, but also aligned with the social contexts in which it operates
- If you do not spend time and effort understanding the existing social system, you risk adversely affecting it
- Social factors refer to the ways in which societal norms, group dynamics, cultural expectations, and interpersonal interactions influence how people engage with and experience technology

General Implications for System Design

Understand Socio-Technical Interdependence

- All systems are socio-technical and will interact with existing social systems
- It’s important to understand these systems to ensure technology works within rather than disrupts existing social/group dynamics, workflows, etc
- Example:
  - London Ambulance Service CAD system

Support Collaboration and Communication

- Design technology that facilitates both synchronous and asynchronous collaboration
- Provide tools for sharing information, supporting decision-making, and enabling team/group/social cohesion
- Example:
  - Group project tools such as Google Docs or Microsoft Teams enable students to collaborate in real-time on assignments, share notes, and communicate and collaborate asynchronously

Optimise Social Distance and Interaction

- Consider the formality of interactions within the system based on context
- Personalise requests and interactions to foster engagement
- Example:
  - Interactions on LinkedIn vs Slack
  - Facebook groups

Foster Motivation and Engagement

- Address intrinsic and extrinsic motivation
- Sustain user engagement and align rewards with both individual and team goals
- Example:
  - Stack Overflow Reputation System

Diffusion of Responsibility

- Ensure tasks and requests are directed at specific individuals rather than generalised groups
- Use personalisation to make interactions feel more human
- Example: in group assignments, tools such as Trello and Notion help assign specific responsibilities to individuals to help avoid situations where no one feels responsible for completing a task

Design for Team Evolution

- Account for team dynamics and changes over time
- Support team cohesion through features that promote shared values and knowledge transfer
- Example: course management tools such as Learn allow lecturers to onboard new TAs by providing access to past class materials, discussions, assessments, etc

Address Organisational and Cultural Contexts

- Align the system with existing organisational procedures, regulatory requirements and cultural norms
- Example:
  - Allowing anonymous submissions for student feedback systems

Plan for Flexibility and Change

- Remember that social and organisational environments evolve
- Design systems that are adaptable to changing workflows, team/group structures and cultural practices to ensure relevance and longevity of the system
- Example: a university course management system that allows lecturers/course organisers to update course materials throughout the semester to adapt to new research or address student feedback

Encourage Shared Goals and Cohesion

- Support shared goals and values among users
- Provide features that foster trust, reduce unnecessary social distance, and encourage collaboration to enhance cohesion of teams or groups of people
- Example: Piazza can foster a sense of community by enabling students to ask and answer questions collaboratively

Mitigate Negative Impacts and Ensure Acceptability

- Ensure the system does not detract from existing processes or increase user burden
- Where a system does introduce change, it must provide clear benefits and fit into users' way of working
- Example: lecture recording systems that ensure students who miss class can watch the lecture without disrupting their learning experience

Activities

Activity 1: Rich Picture

Rich Pictures

- Rich pictures are **cartoon-like depictions** of
  - the primary **users/stakeholders** in a system,
  - their **interrelationships**
  - and their **concerns**

- Rich pictures help elicit and represent an understanding of the **social context** for a technology design project

- Monk, S. and Howard, S. (1998) The rich picture: a tool for reasoning about work context. Interactions 5(2), 21-30 http://doi.acm.org/10.1145/274430.274434

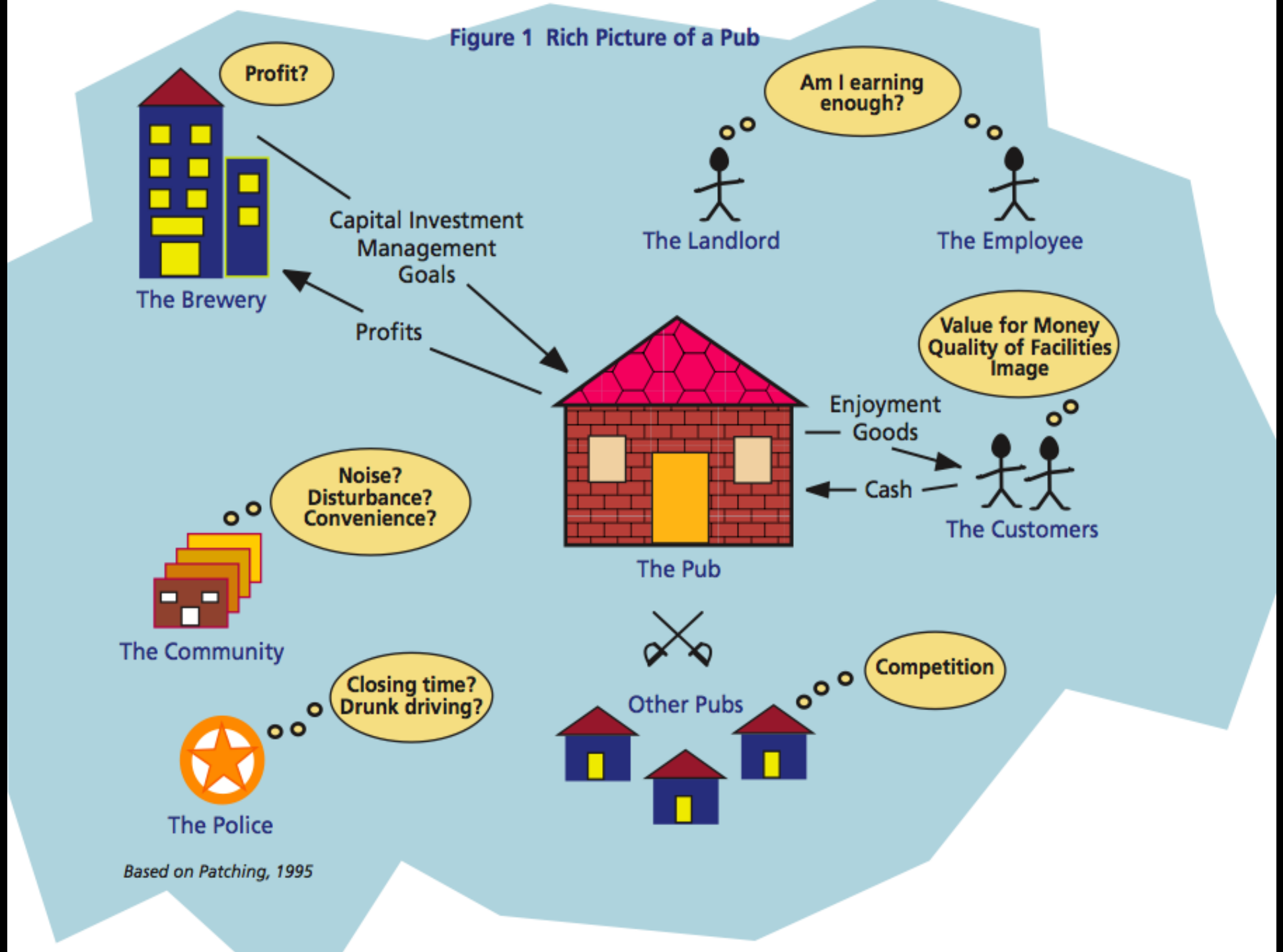


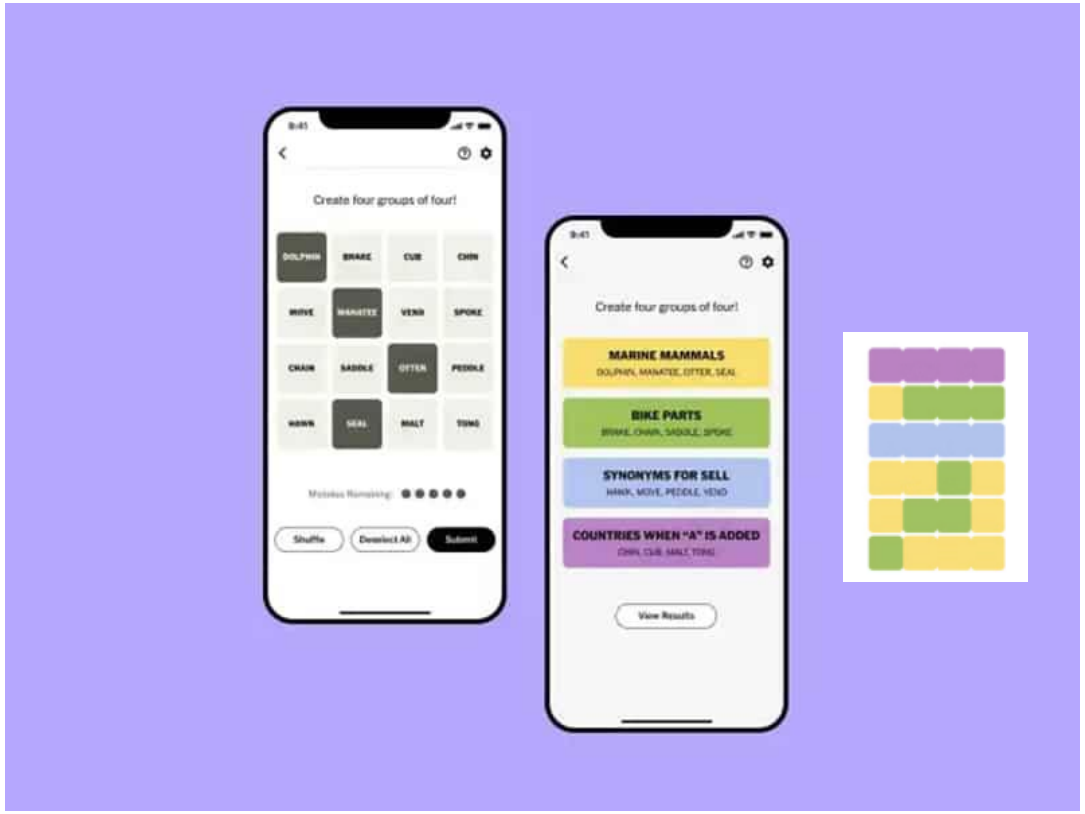
Figure 1 Rich Picture of a Pub
Profit?
The Brewery
Capital Investment
Management
Goals
Profits
Am I earning enough?
The Landlord
The Employee
Value for Money
Quality of Facilities
Image
Enjoyment
Goods
Cash
The Customers
The Pub
Noise?
Disturbance?
Convenience?
The Community
Closing time?
Drunk driving?
The Police
Other Pubs
Competition
Based on Patching, 1995

Table 1. Elements of an Effective Rich Picture

Element	Comment
1. Include *structure*	Include only enough structure to allow you to record the process and concerns. The latter requires that all the people who will use or could conceivably be affected by the introduction of the new system be included.
2. Include *process*	Do not attempt to record all the intricacies of process; a broad brush approach is usually all that is needed
3. Include *concerns*	Caricature the concern in a thought bubble (see Figures 1–3 for examples). A fuller explanation may be provided in a supplementary document
4. Use the language of the people depicted in it	This will make the rich picture comprehensible to your informants
5. Use any pictorial or textual device that suits your purpose	There is no correct way of drawing a rich picture. There are as many styles as analysts and the same analyst will find different styles useful in different situations

Monk & Howard (1998)

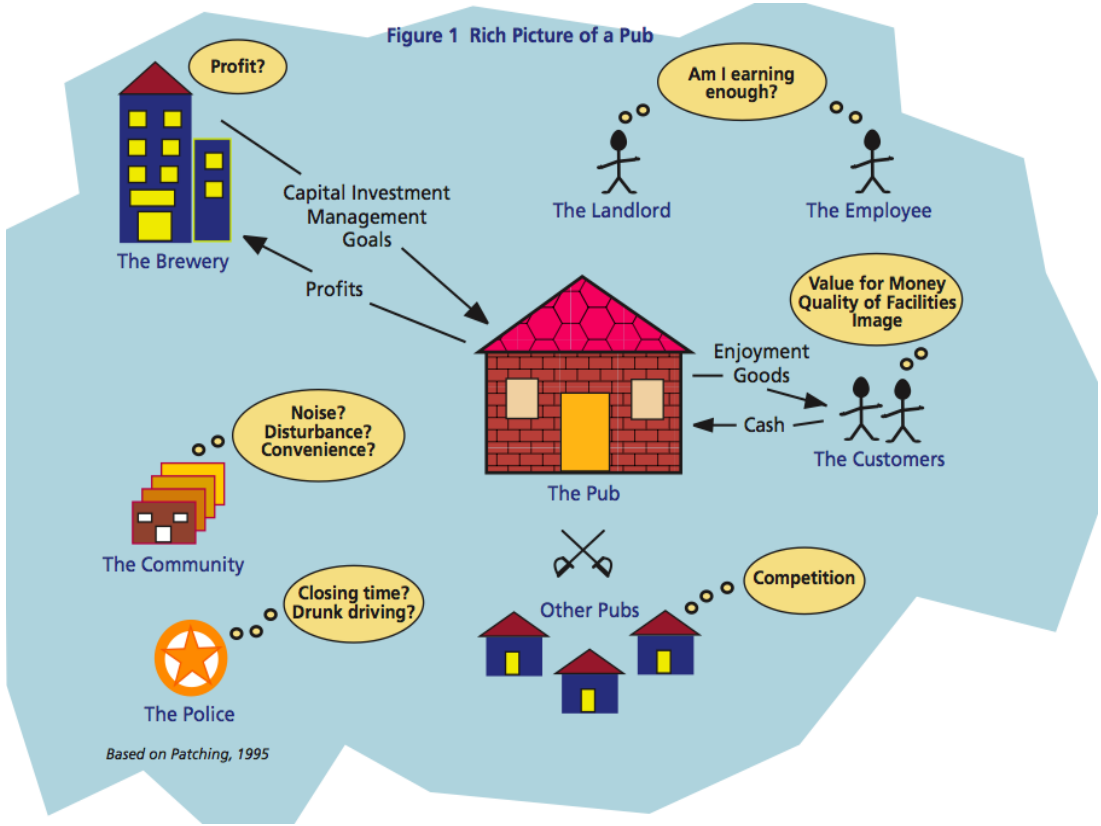
Example: NYT Connections Puzzle



https://www.devinedesign.net/new-york-times-connections/

- Technology:
  - Interact with the puzzle through the app
  - Real-time feedback on correct or incorrect groupings of words
  - Online communities that share hints and tips for each new puzzle each day
- Social:
  - Individual use: complete the puzzle at the end of the workday
  - Shared experience: sharing puzzle results with family members
  - Competition: family members compete each day via this sharing
- Cultural:
  - The puzzle is created in the US
  - The puzzle varies in how challenging it is

Activity 1: Create a Rich Picture of your social context

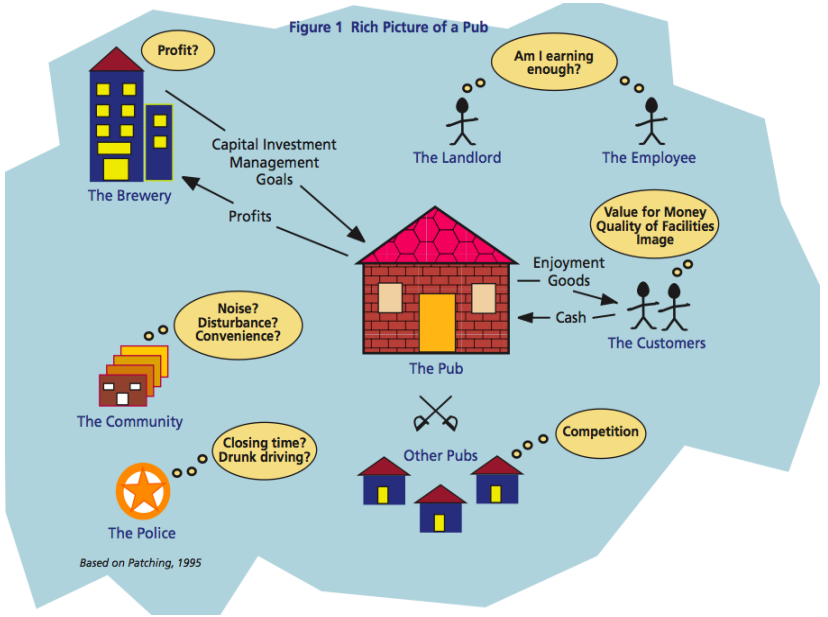


Activity 2: Work on Say Method

Questions about the social context

- *Who was involved in x?*
- *What did they do? Why? How were they affected by x?*
- *Where did x take place? Can you tell me more about the place?*
- …

- This is to get a broad understanding, so you can create re-design suggestions that work within the social context



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Any questions?