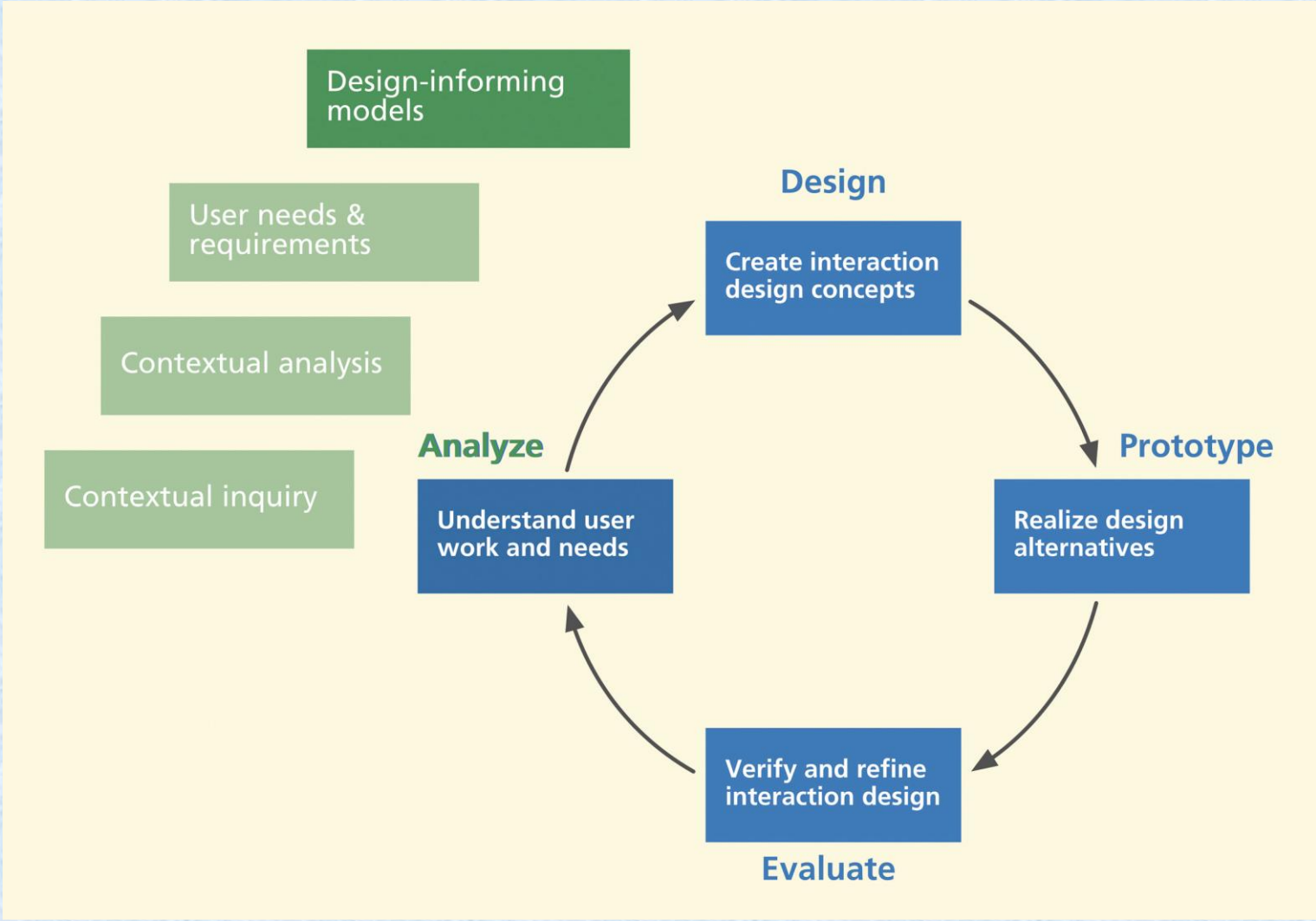
User experience design

Chapter 6. Constructing Design-Informing Models

Introduction



Design-informing models

- **Second span of bridge across analysis-to-design gap**
- **Not building blocks that appear directly in a design**
- **Artifacts that drive, inform, and inspire design**

Design-informing models

- **Design-oriented constructs, such as task descriptions or user personas**
- **Turn contextual data into actionable items to guide design**
- **Elements to consider or take into account in design**

Extract inputs to models

- Usually in parallel with requirements extraction, if that is done
- Walk your work activity affinity diagram
  - Look for references to any of the models
    - Example, notes related to tasks, user characteristics

Extract inputs to models

- **Look at bins of sorted work activity notes, if you still have any**
- **Especially look for barriers to work practice**
  - **These represent opportunities to improve**

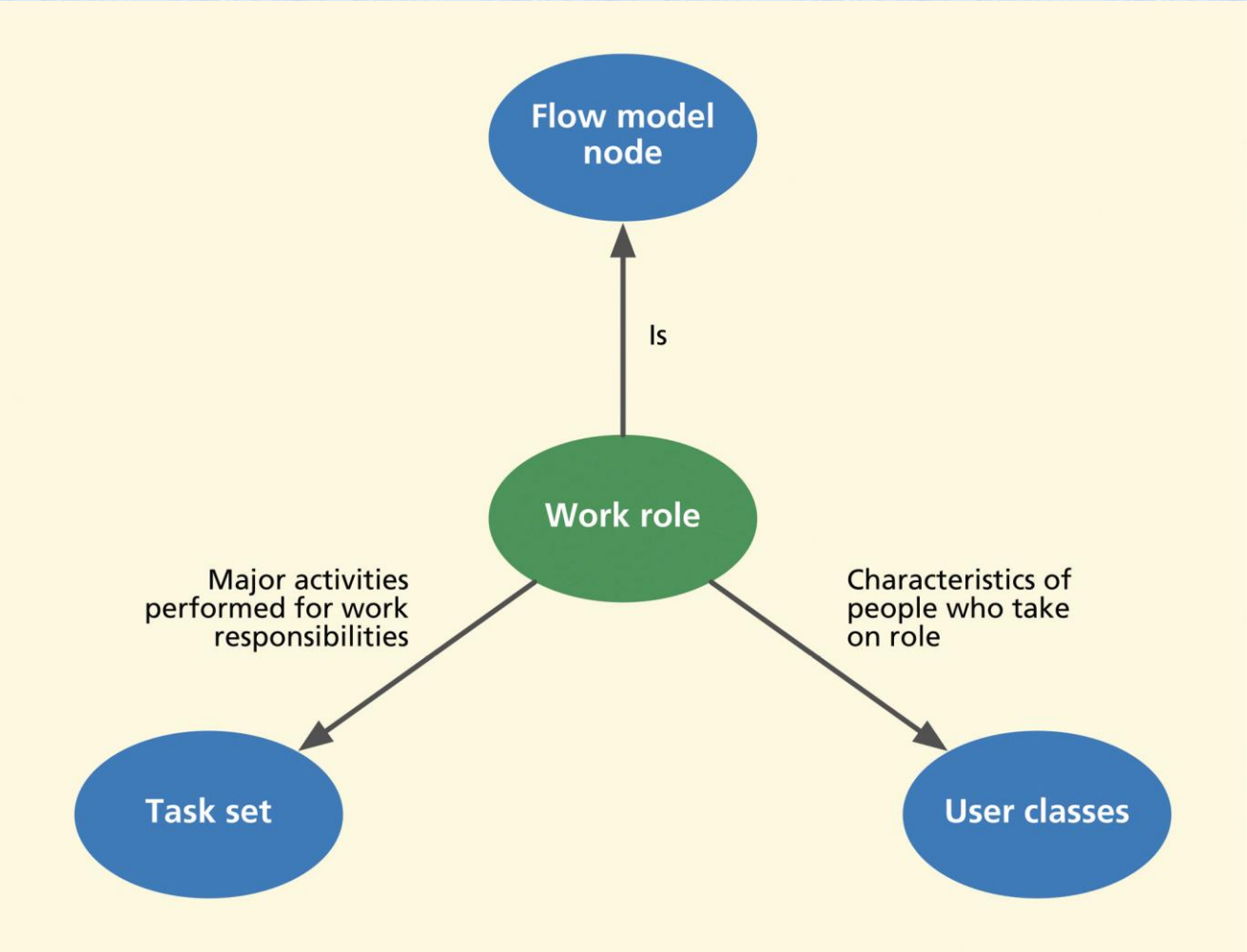
User models

- **Work Roles**
  - **You have already started identifying these**
- **Sub-roles**
  - **Examples, student ticket buyer, alumni ticket buyer, general public ticket buyer**
- **Mediated work roles**
  - **Not direct system users**

Example, work roles

- In MUTTS ticket seller uses system to help ticket buyer buy tickets
- Ticket buyer will become direct user in the Ticket Kiosk System

Relationship of work roles to other concepts



User classes

- **A user class**
  - **Defined by characteristics of people who might take on corresponding work role**
    - **Knowledge- and skills-based characteristics**
    - **Physiological characteristics**
    - **Experience-based characteristics**

Example, user class

- **General public ticket buyer for Ticket Kiosk System could include senior citizens with limited motor skills and some visual impairment**

Common elements of models

- Information and other needs in tasks
  - Just before step in which need occurs
  - Add indented line beginning with red block
    N
    - Followed by description of need
- Barriers within task interaction models
  - Denoted with red lightning bolt 
    - Followed by description of barrier

Social models

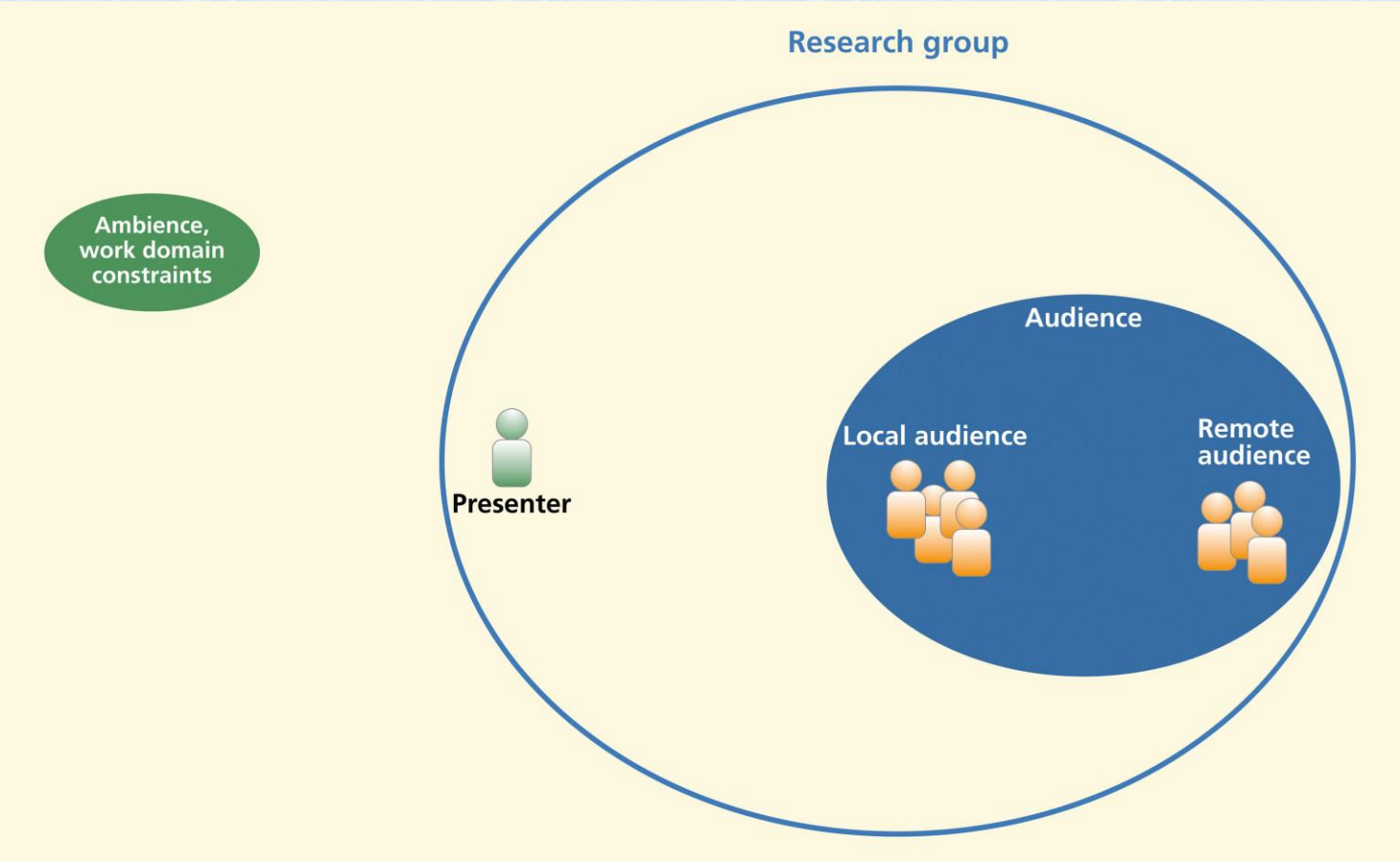
- Communal aspects of workplace
- Philosophy, ambiance, and environmental factors
- Norms of behavior, influences, attitudes, and pressures
- Concerns of individuals in specific work roles
- Influences, mind-sets, feelings, attitudes

Making a social model diagram

- **Identify active entities and represent as nodes**
- **New example: Slide show presentation situation with both local and remote audiences**

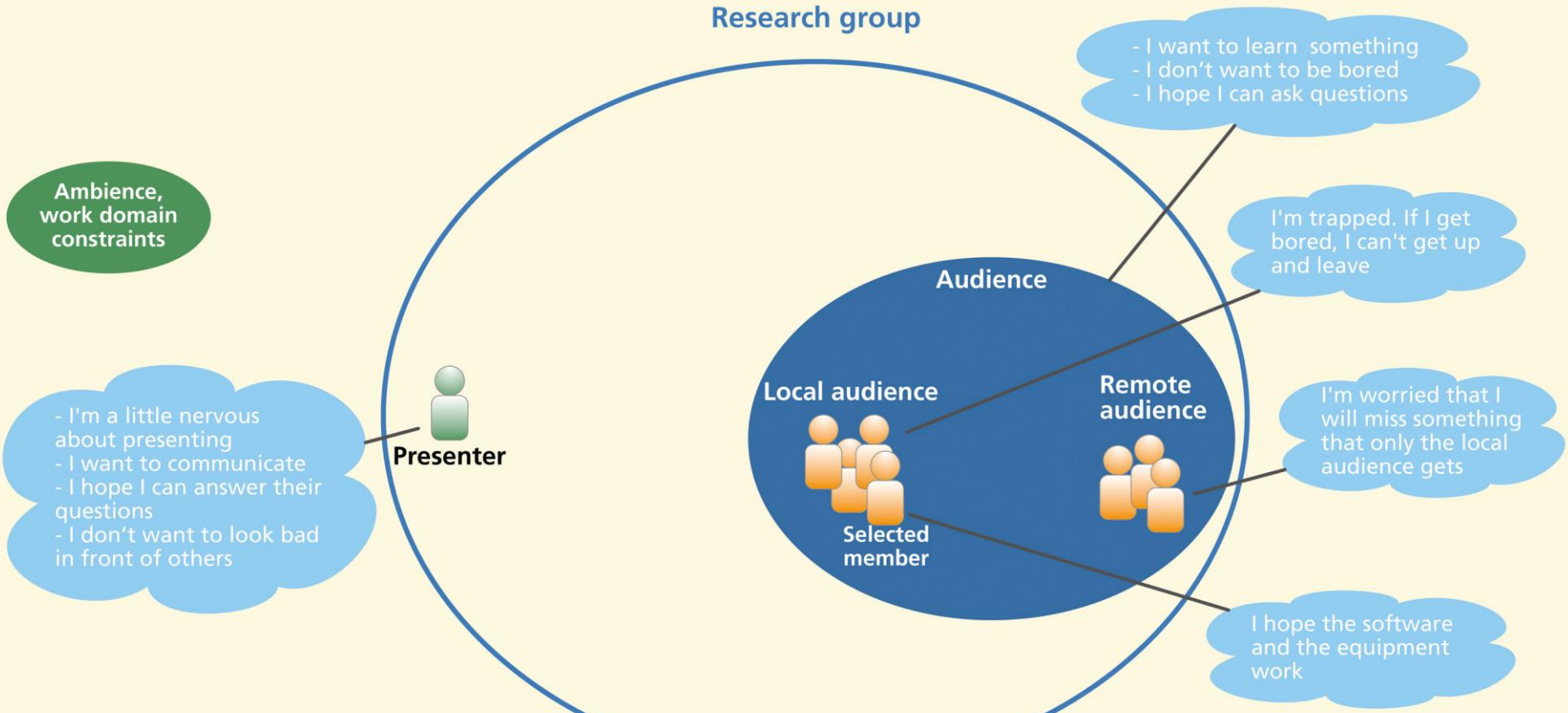
Example

- **Entities for slide show presentation situation**



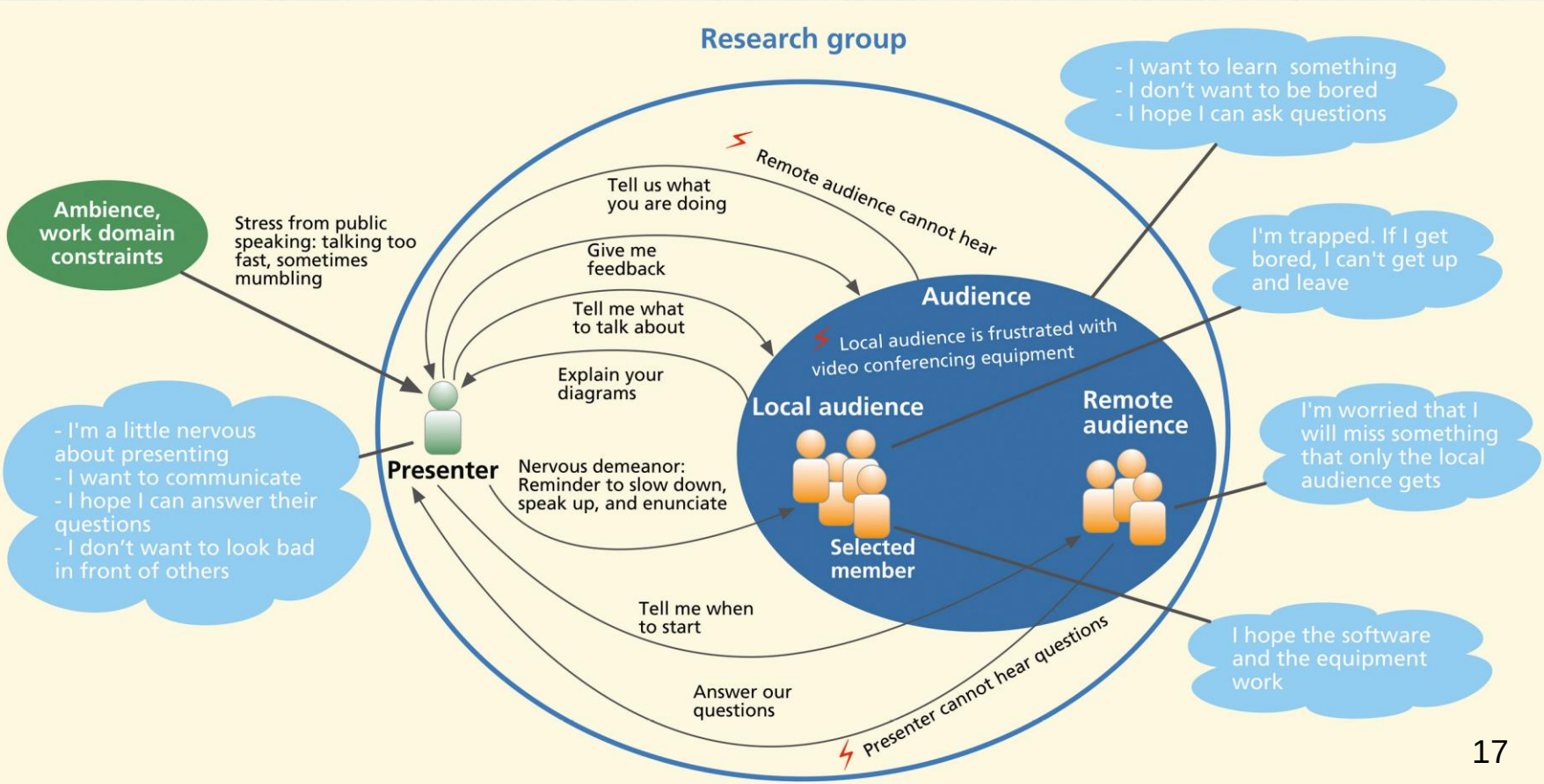
Making a social model diagram

- **Identify concerns and perspectives**
- **Represent as attributes of nodes**



Making a social model diagram

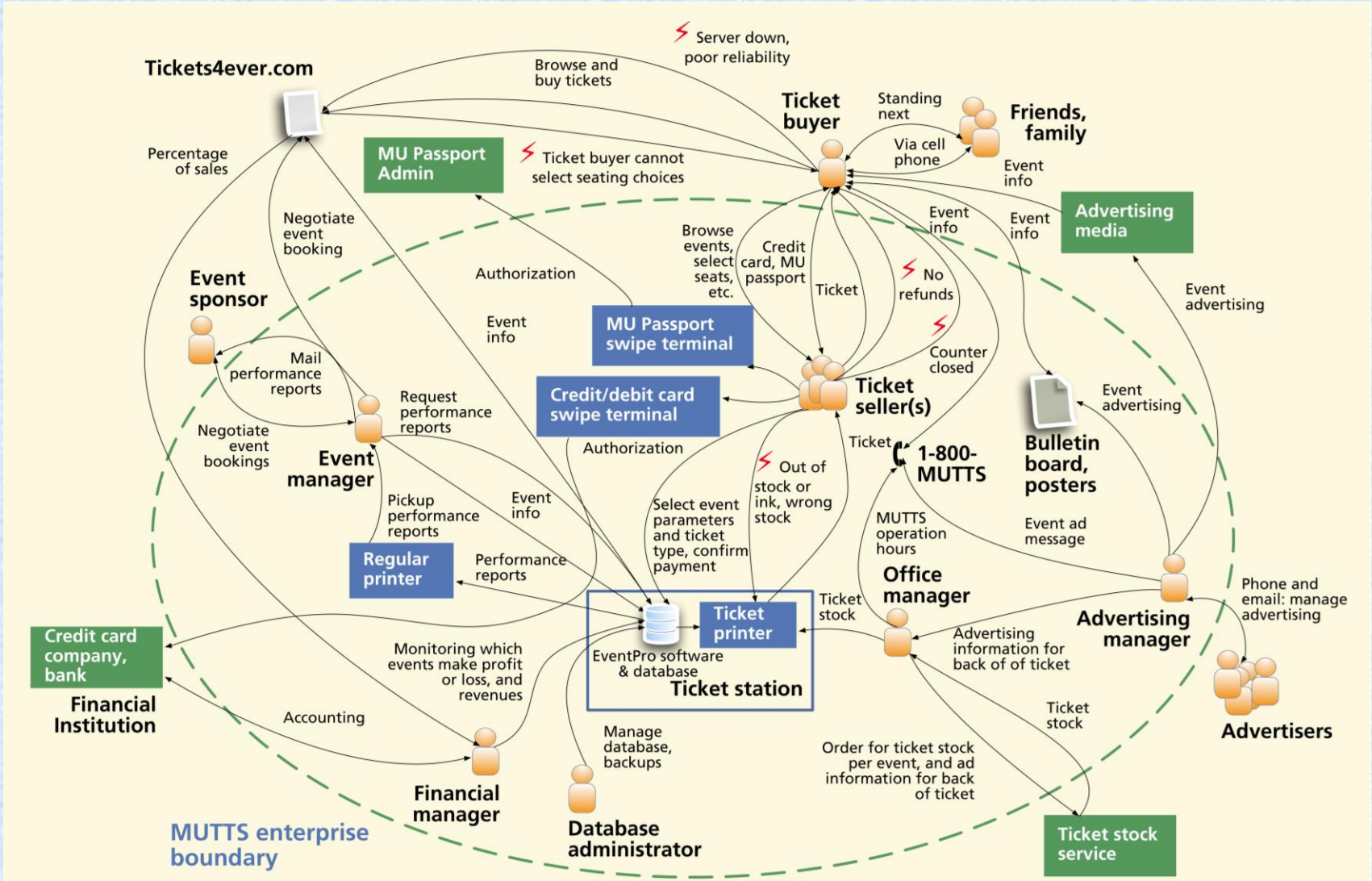
- **Identify influences**
- **Represent as relationships (arcs) among entities**



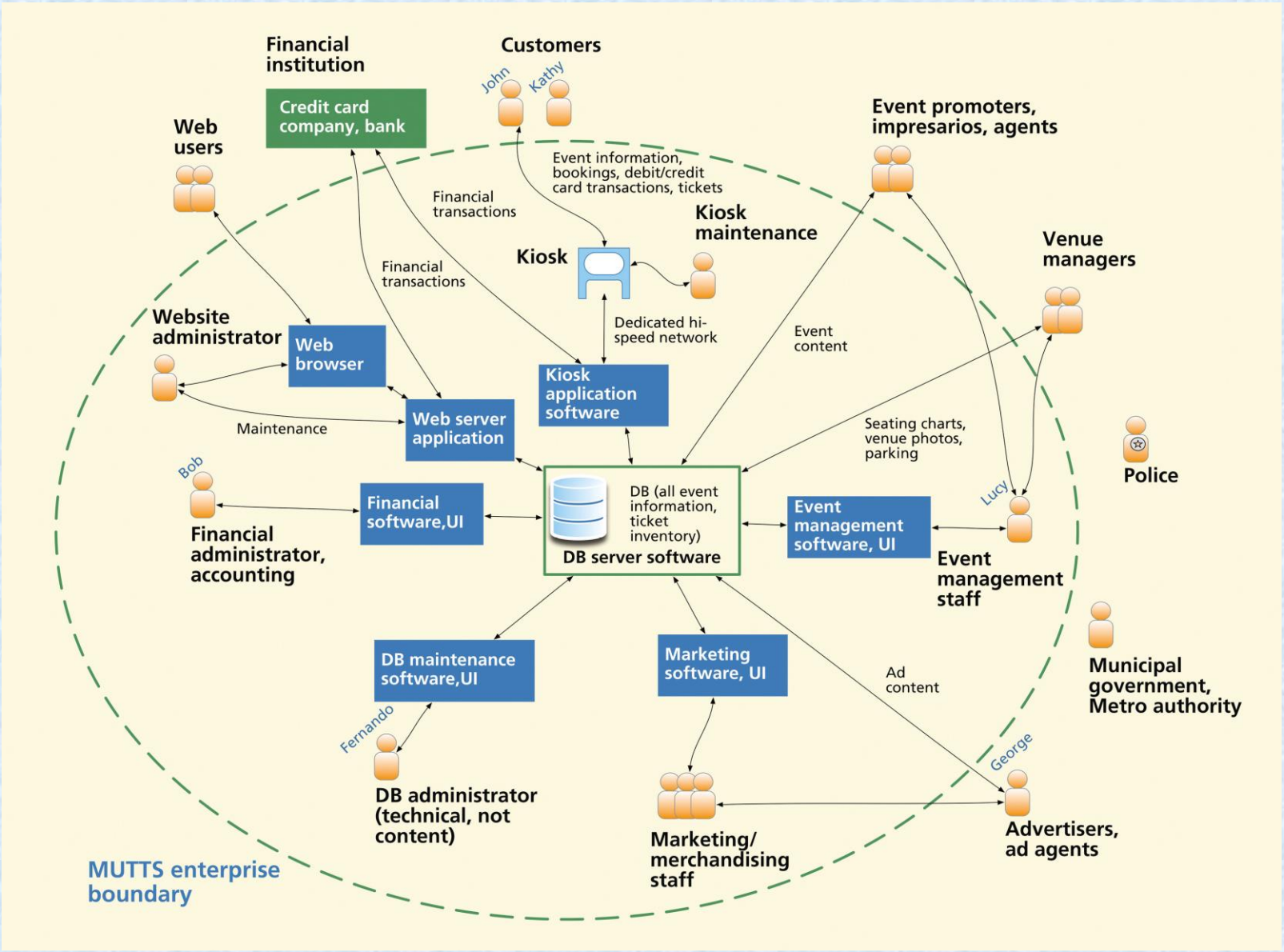
Usage models

- **Continue to develop flow model**
  - **Scope is entire work practice**
  - **Bird's-eye view of entire workflow**
  - **Nodes for active entities**
  - **Arcs for flow of work, information**
  - **Include non-human entities**
    - **Example, central database and non-computer communication flow such as via email, telephone**

Example flow model for MUTTS



Envisioned flow model for kiosk



Task models

- **Tasks vs. functions**
  - **Task: something a user does**
  - **Function: something system does**
  - **Example, information is displayed/viewed**

Task structure model—Hierarchical task inventory

- Tasks broken down into subtasks and steps
- Just like functional decomposition in software hierarchy
- Show what user tasks and actions are possible

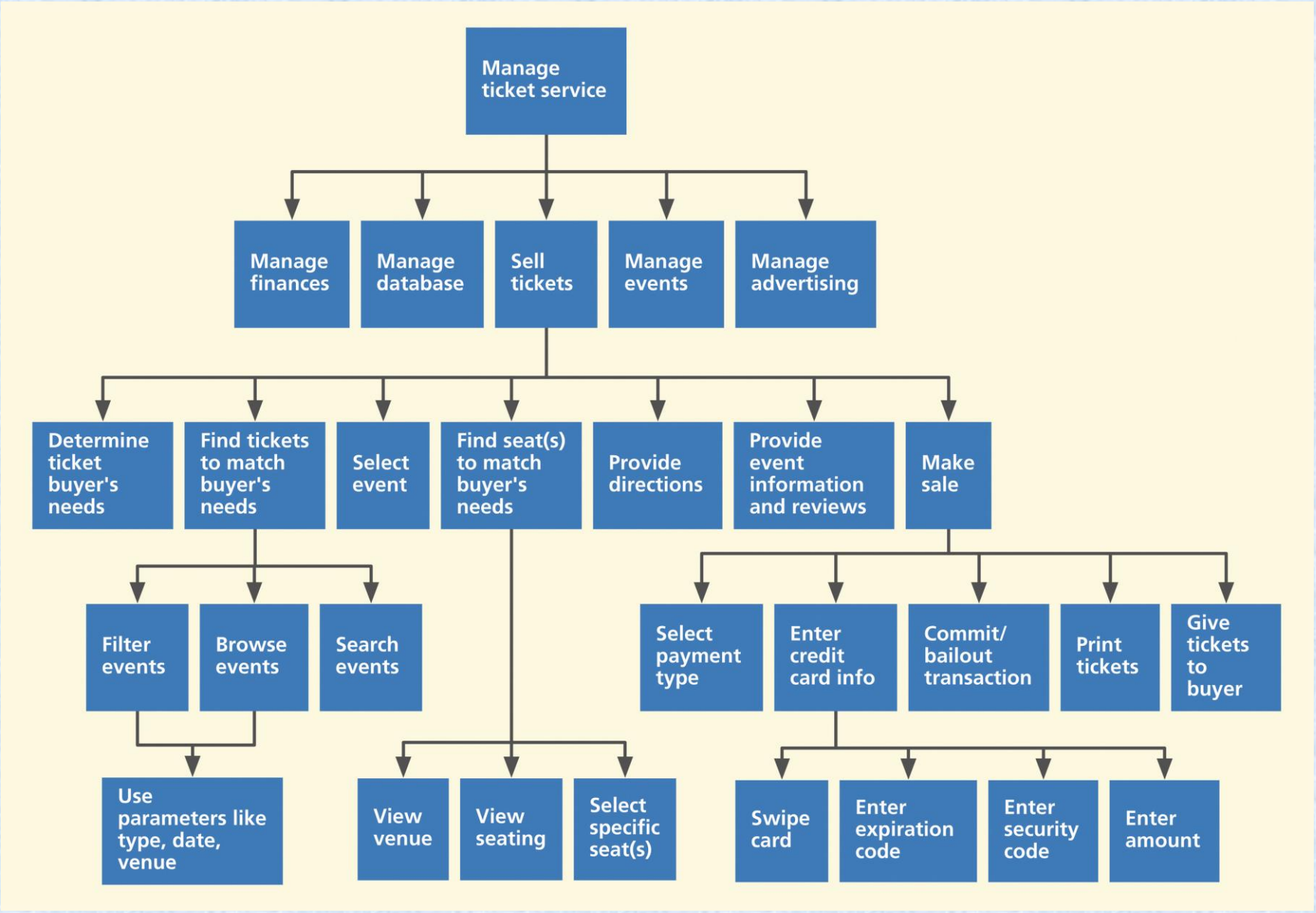
Hierarchical task inventory

- **To guide overall design**
- **Use as checklist for keeping track of task coverage in design**
- **For matching that coverage to your inventory of scenarios and other task representations**

Hierarchical task inventory

- **Does not represent temporal ordering**
- **See book for rules and guidelines for creating an HTI diagram**

Example HTI for MUTTS



Task interaction models

- **Usage scenarios as narrative task interaction models**
  - **Stories about**
    - **Specific people**
    - **Performing work activities**
    - **In a specific existing work situation**
    - **Within a specific work context**
    - **Told in a concrete narrative style**
    - **As if it were a transcript of a real usage occurrence**

Usage scenarios

- **Describe key usage situations happening over time**
- **Deliberately informal, open-ended, and fragmentary**
- **See book for typical components and contents**

Example, MUTTS usage scenario

Priya and some friends plan an evening out together on the weekend. They agree to meet at the MUTTS ticket window on Friday afternoon. Some walk to MUTTS, while others take the bus. With the work week behind them, the group is in a festive mood, looking for entertainment. They decide to check out events for Saturday night. After waiting in line, Priya asks the ticket seller what kinds of events have tickets available for Saturday night.

Example, MUTTS usage scenario

The ticket seller looks through her computer listings of movies, concerts, play, fairs, carnivals, and special events and tells the group about their options. After talking among themselves, they decide they want to go to a concert.

Example, MUTTS usage scenario

The ticket seller asks, “Which kind, classical or pop?” They choose to go with a pop concert. Again, she tells them their options. They finally decide on a concert playing at The Presidium.

There is some unease within the group, though, because they feel that the ticket seller did not give them enough information to make the best choice. Also they felt some pressure to decide in a hurry, as the ticket seller was standing there and waiting.

Example, MUTTS usage scenario

They ask about what seats are available and the ticket seller goes back to her computer and brings up a graphical seating map of the hall. However, the tickets the ticket seller has on hand are for only a subset of the seats actually available, forcing the group to pick from these, knowing they had not seen all the real options.

They choose their seats based on price and seat location and the ticket seller requests an option to buy the tickets, locking out others until the transaction is either completed or given up.

Example, MUTTS usage scenario

The group agrees on the purchase and then discusses the matter of paying. They decide to give Priya cash and she will pay on her credit card, so Priya swipes her credit card through the slot on the counter. The transaction is authorized by the credit card company, the sale is committed, and the ticket seller gives them the tickets. The group is happy, but they leave with a nagging feeling that there must be a better way to buy tickets.

Step-by-step task interaction models

- Contains a detailed description of task performance observed in users or as told by users
- Shows detailed steps of task performance
- Includes temporal ordering of actions and activities

Step-by-step task interaction models

- Not complete task specifications
- Mostly linear paths, but can add branching and looping if necessary
- Can gather great understanding from one task path
  - Without the complexity of covering all cases

Creating a step-by-step task model

- **Mostly textual**
- **Task name**
- **Task and step goals**
- **Triggers**

Creating a step-by-step task model

- **Information and other needs in tasks**
  - **Just before step in which need occurs, we add an indented line beginning with a red block N, followed by a description of need**
- **Barriers within task interaction models**
  - **Denoted with red lightning bolt ()**

Example, MUTTS

Task name: Finding entertainment for a given date (performed by ticket seller on behalf of ticket buyer)

Task goal: Helping a ticket buyer choose and buy a ticket for entertainment for this coming Friday night

Task trigger: Ticket buyer arrives at MUTTS ticket window on way home from work on a Thursday evening, thinking ahead to weekend

Example, MUTTS

1. Ticket Buyer: Tells ticket seller about general goal of wanting to find an entertainment event for next night (Friday)
2. Ticket Buyer: Asks about available types of entertainment
3. Ticket Seller: “There are plays, concerts, movies, and sports”
4. Ticket Buyer: Not enough information yet to decide on category. Asks about examples of different types.
5. Ticket Seller: Gives examples

Example, MUTTS

- **Step goal: Try to narrow it down**

6. Ticket Buyer: Asks what events are available for Friday night

Barrier  **: Ticket seller sees that number of results is still too large to sort through or tell customer about**

Response to barrier:

7. Ticket Seller: Ask customer how to filter results or narrow it down (e.g., "Tell me more about what you like")

And so on…..

Essential use case task interaction models

- **A structured narrative**
  - **In language of users in work domain**
  - **Describes a single user intention or goal**
  - **Complete, well-defined task description that is meaningful to a user in a role**
  - **More abstract and less specific than previous step-by-step task interaction model**
  - **Task skeleton on which a scenario story could be woven**

Example, essential use case

- **Paying for a ticket purchase transaction (with a credit or debit card)**
- **Sequence of user intentions and system responses**

Example, essential use case

1. Ticket buyer: Express intention to pay
2. System: Request to insert card
3. Ticket buyer: Insert card
4. System: Request to remove card quickly
5. Ticket buyer: Withdraw card
6. System: Read card information
7. System: Display summary of transaction and cost
8. System: Request signature (on touch pad)
9. Ticket buyer: Write signature
10. System: Conclude transaction
11. System: Issue receipt
12. Ticket buyer: Take receipt

Information object model

- **Design ontology is**
  - **Description of all objects and their relationships**
  - **Users, user actions, tasks, everything surrounding existence of a given aspect of a design**

Example

- **Identifying information objects and attributes in MUTTS**
  - **“Ticket” = a principal information object in system**

Example, scenario analysis

- **To help identify ontological elements of the Ticket Kiosk System**
- **Highlighting some ontological elements of a design scenario**

Example, scenario analysis

On cellphone and email over a day or two, Priya and a group of her friends agree to take in some entertainment together on the coming weekend. They agree to meet at the Ticket Kiosk System kiosk at the library bus stop at 5:30 PM on Friday. Some walk to the kiosk from nearby, while others avail themselves of the convenience of the bus. The group is in a festive mood, looking forward to sharing some fun over the weekend.

Example, scenario analysis

Priya steps up to the kiosk and sees a "Welcome" screen with an advertisement for a movie scrolling at the top and text that says "What kind of even information would you like to see?," followed by several touchscreen buttons with labels on the left-hand side such as "Browse by event type," "Browse by venue/location," and "Event calendar: Browse by date." On the right-hand side there are buttons for specific types of events, such as "Sports," Concerts," "Movies," "Special features," etc.

Example, scenario analysis

Because they are looking for something specifically for the next night, she touches the "Event calendar" button, looking for events such as movies, concerts, play, fairs, or even a carnival for Saturday night. After browsing for a while and talking among themselves, they want to go to a concert. Priya touches the "Concerts" button, and they are presented with the subcategories Rock, Classical, Folk, and Pop. They choose to go with pop concerts and Priya touches that button. From among several choices, they finally decide on a concert called "Saturday Night at the Pops" playing at The Presidium.

Work environment models

- Define milieu in which work gets done
- How related work environment factors affect tasks in real usage
- Include constraints, artifact models, and physical models
- Physical model is probably most important

Artifact Model

- **Shows how tangible elements (physical or electronic) are used and structured in business process flow of doing work**
- **Work artifacts**
  - **Among most important ontological elements of design**
  - **One of most important entities that get passed within flow model**

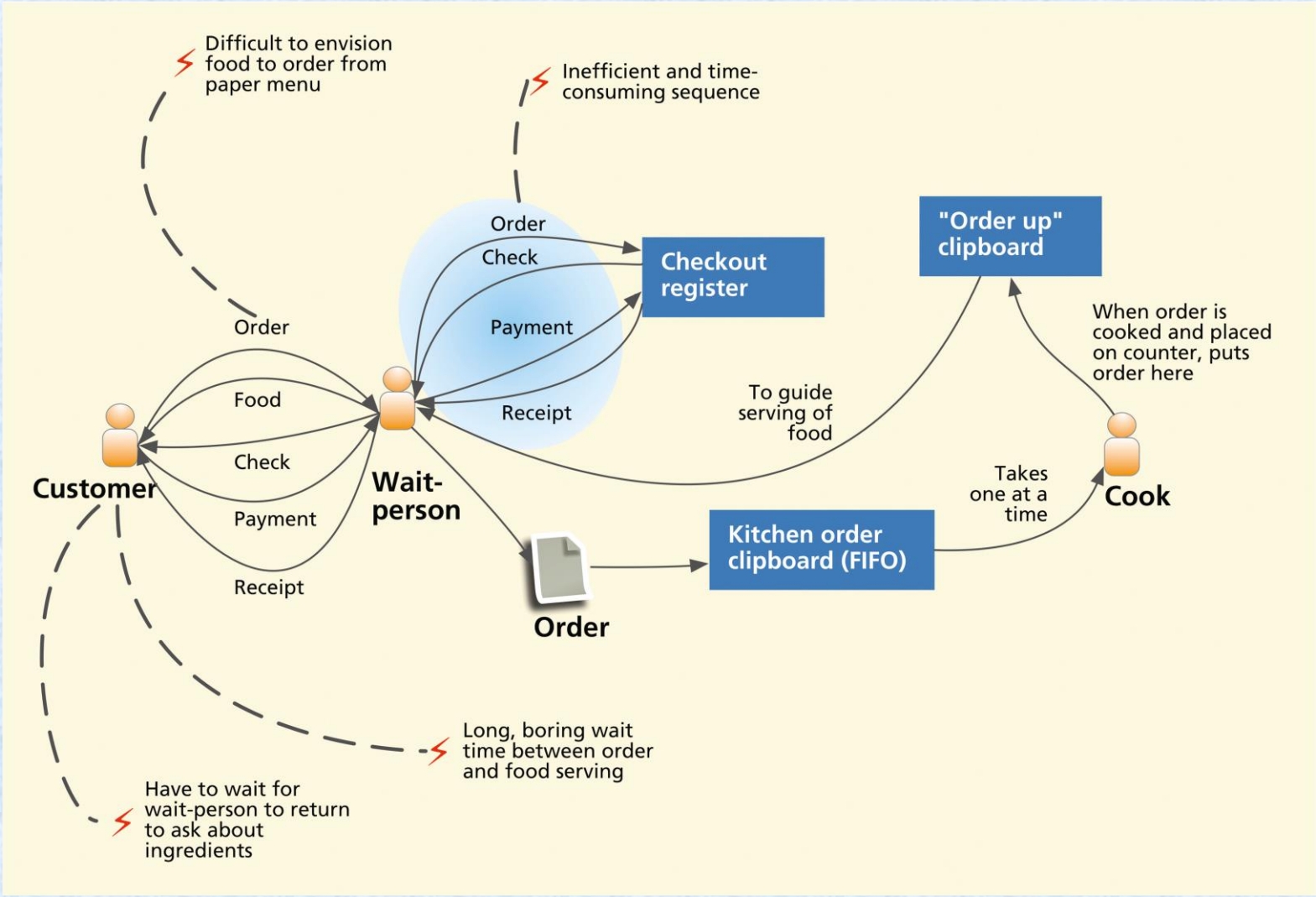
Work artifacts

- **Examples include paper memos, email messages, correspondence templates, product change orders, and other things people create and use while working**
- **Example, an order form being filled out, that reveal traces of people's work practices**

Artifact model

- **Contextual inquiry team must pay close attention to how these artifacts are created, communicated, and used.**
  - **What are those notes scribbled on those forms?**
  - **Why are some fields in this form left blank?**
  - **Why is there a sticky note on this form?**
  - **Perhaps a signature is required for approval on other kinds of documents.**

Example, work flow of restaurant artifact



Artifact model

- Mainly a collection of artifacts
- You can organize it for analysis and use
- Make "artifact posters"
  - Attach samples of each artifact to a separate flip chart page
  - Hang up for group to see
  - Annotate with stick-on notes

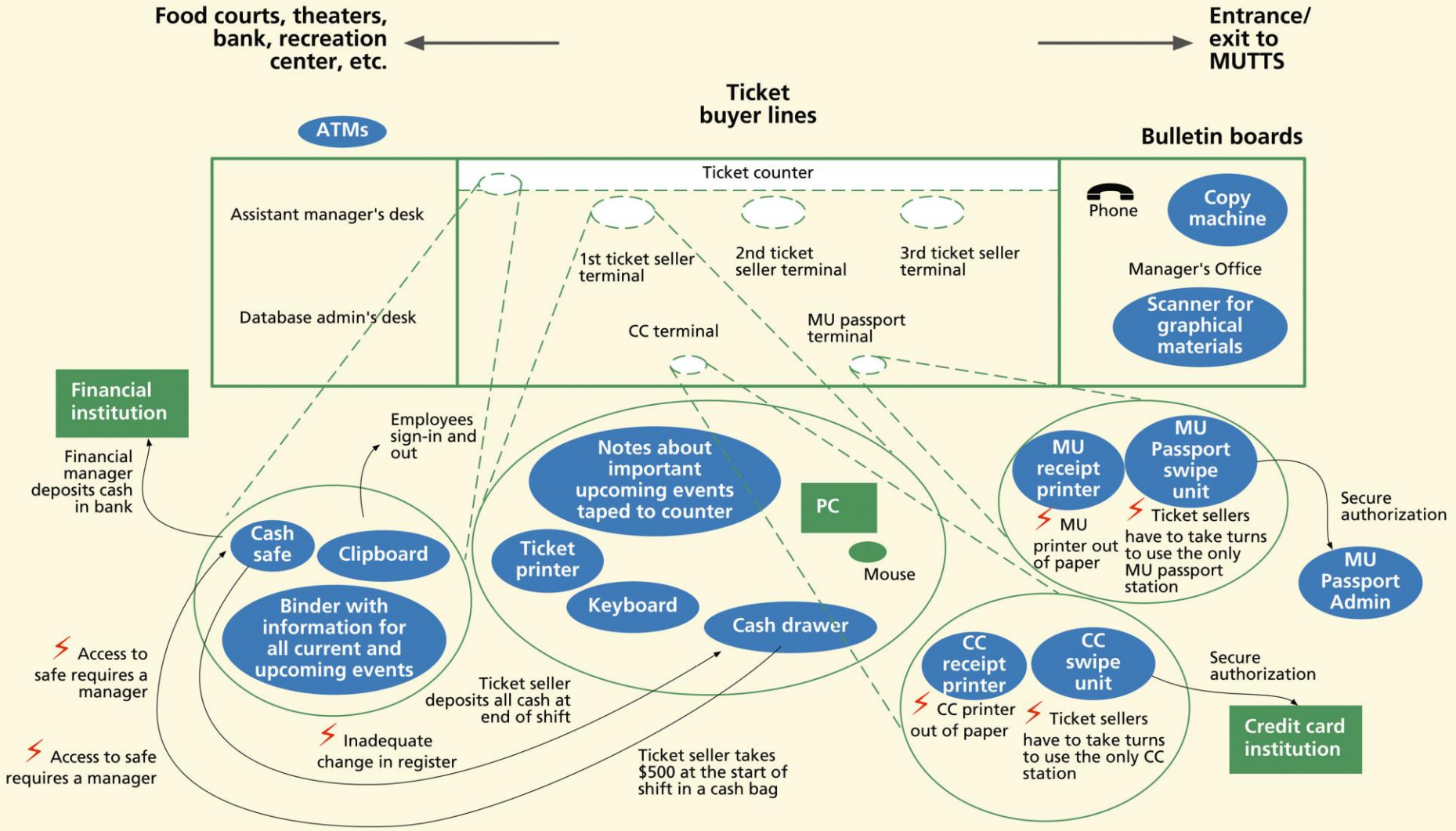
Physical model

- Gives roles, activities, and artifacts of other models a physical setting
- Shows physical dimensions of work spaces, buildings, walls, rooms
- Shows workstations, all physical equipment, and collaboration spaces

Physical model

- **Does not have to be exact to-scale floor plan**
- **Placement and paths of movement of people and objects**

Example: MUTTS physical model



Barrier summary

- In all models, barriers are important
- They represent opportunities to improve in new design
  - Each model tells partial story
  - Summary brings it all together

Model consolidation

- Multiple groups working in parallel can produce multiple partial models
- Get everyone together and consolidate by merging, uniting, and combining
- Bottom-up process to build general model from pieces
- See example in book

Abridged methods for model extraction

- **Be selective about modeling**
- **Decide which models are most important for your project, system, or product**
- **Create hybrid of WAAD and relevant models on same wall**

Example, abridged method

- **Interpersonal concerns**
  - **Would usually capture in social model**
  - **But can be just annotations on group of notes in WAAD**