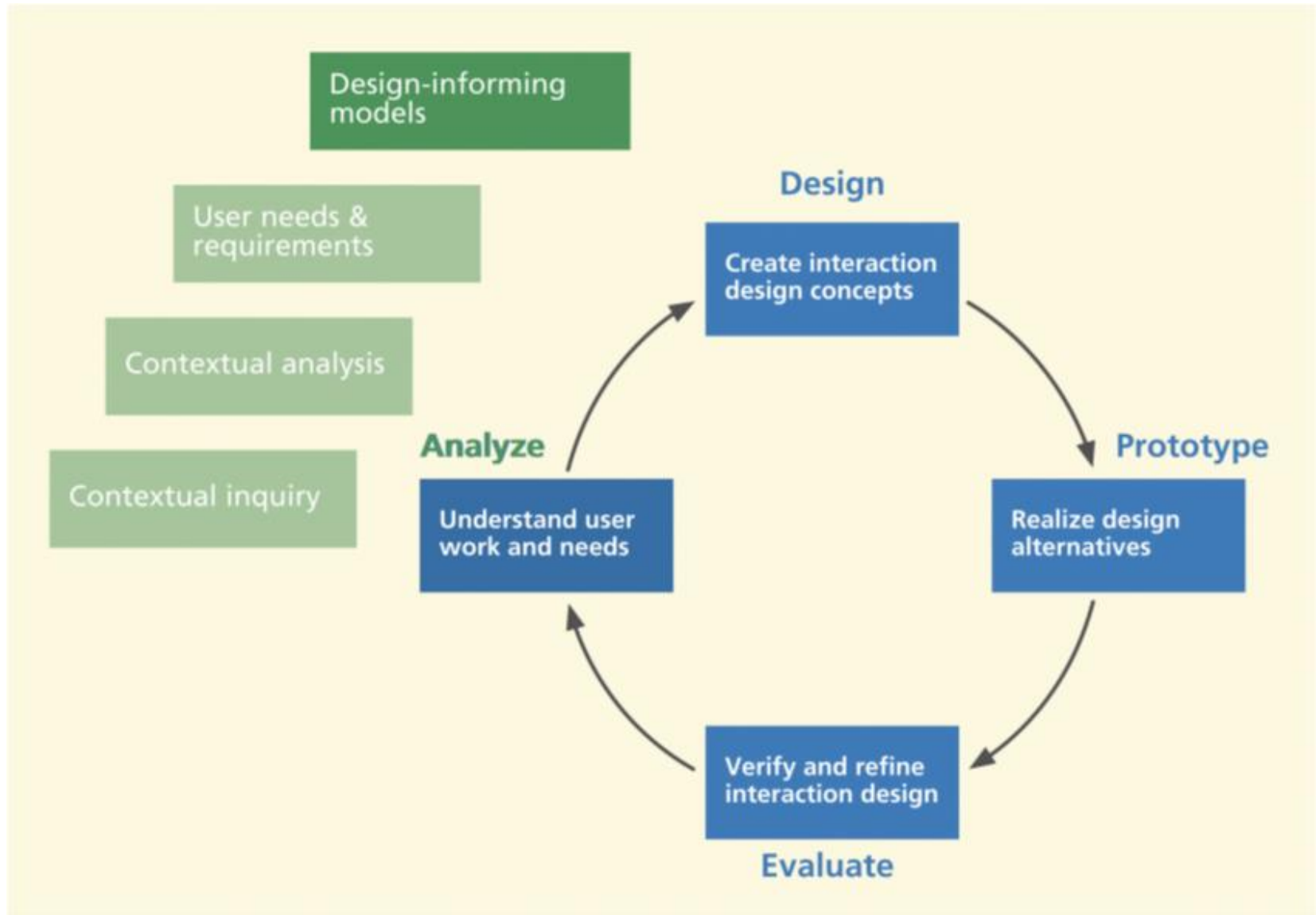


Design-Informing Models

Selected material from *The UX Book*, Hartson & Pyla



Design-Informing Models

- **Bridge analysis and design**
- Models that **drive** and **inspire design**
- **Design-oriented constructs**, such as **task descriptions**, but not design elements per se
- **Walk the WAAD** as for (during) requirements extraction
 - **Normal operation**
 - **Barriers** to work practice – opportunities for improvement

Interface Design as Story Telling

- The “**big picture**” view of the **scenarios** of how **work goals** are **accomplished** through **system interaction**
 - Work role responsibilities
 - Work role interactions
 - Work environment
 - Work decomposition into sequences of system interactions
- **Design to support the story**

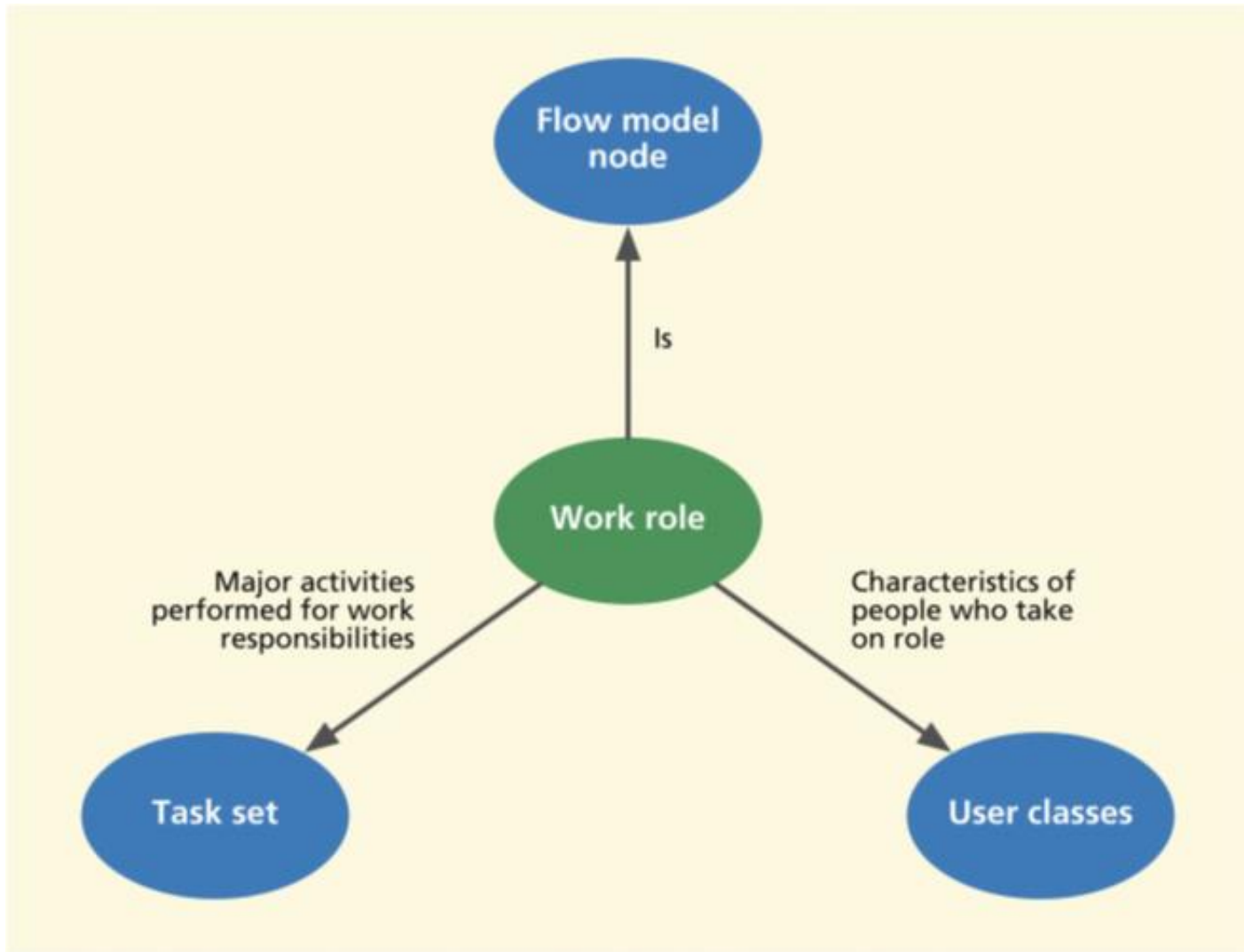
Design-Informing Models

- User models
- Social models
- Usage models
- Information object models
- Work environment models

User Models

- **Work (user) roles** – direct “**primary**” users
- Indirect (“**secondary**”) roles – **not direct users** but **affected** by the system in some way
- Example – ATM
 - Direct roles – customer, service person
 - Indirect role – bank security officer
- Roles may be related
 - E.g., supervisor could perform the work of a subordinate

Note: Personas are another kind of user model to be discussed later



User Classes

- **User profile** – general characteristics of people who perform the work role
- **Knowledge, skills, education** required to perform the job
- **Physical** and **cognitive** abilities and disabilities
- **Personal** data – age range, locale, ethnicity, ...
- **Experience level** – novice, intermediate, expert
 - Who do you design for?

Social Models

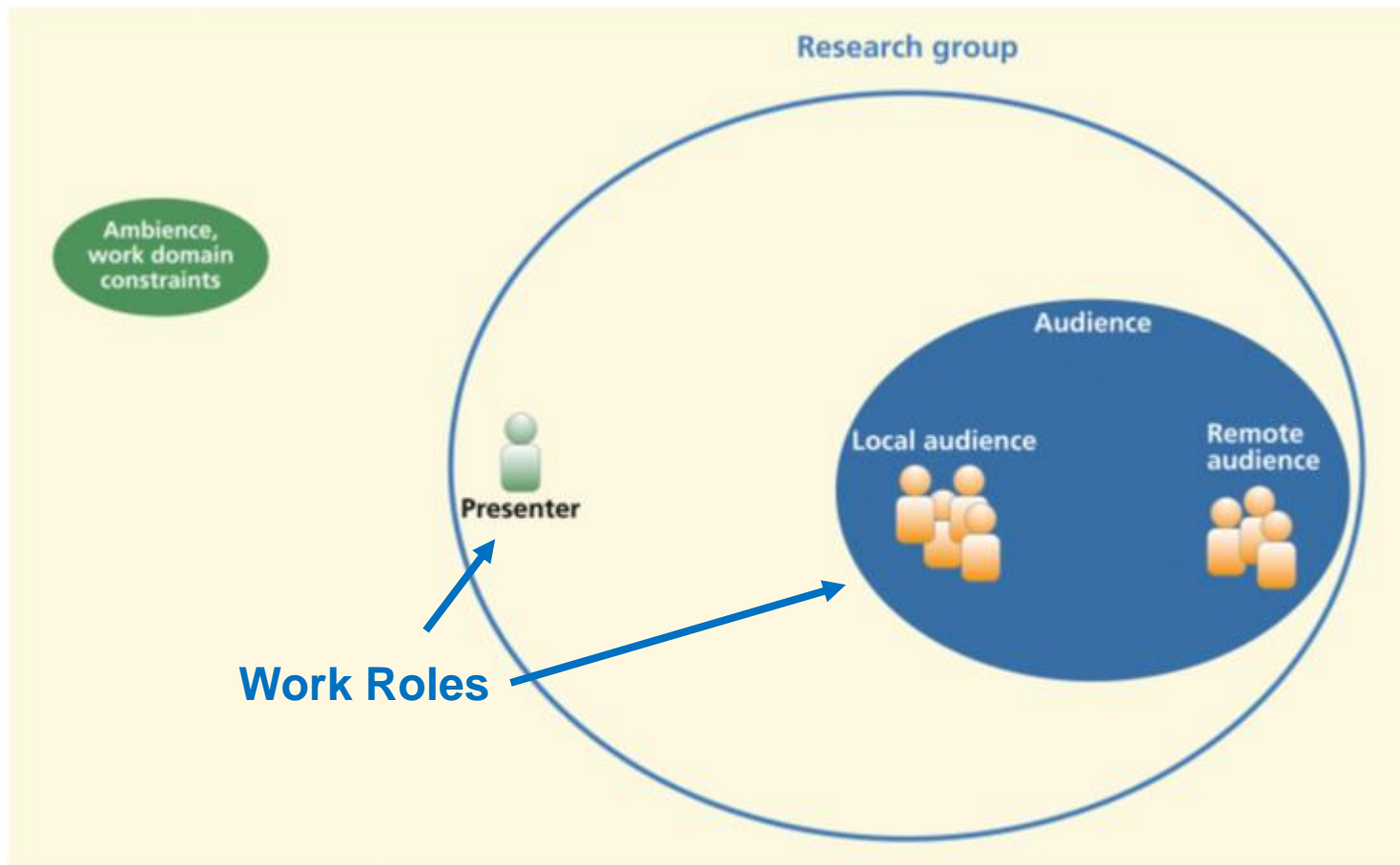
- **Communal** aspects of the work **environment** ...
- **Work** role related **concerns, perspectives, influences** and **constraints**;
 - Norms of behavior, influences, barriers, and pressures
 - Philosophy, mind-sets, feelings (emotions), attitudes
 - Environmental factors and ambiance

Social Model Diagram

- **Nodes** – **work roles** and any **outside actors** (human and non-human) that interact with work roles
- **Group** as appropriate (analogous to an organization chart)
- Annotate role related **concerns and perspectives** as **node attributes**
- **Workplace ambiance** – the “**culture**” of how work gets done
- **Constraints and influences** on work practice

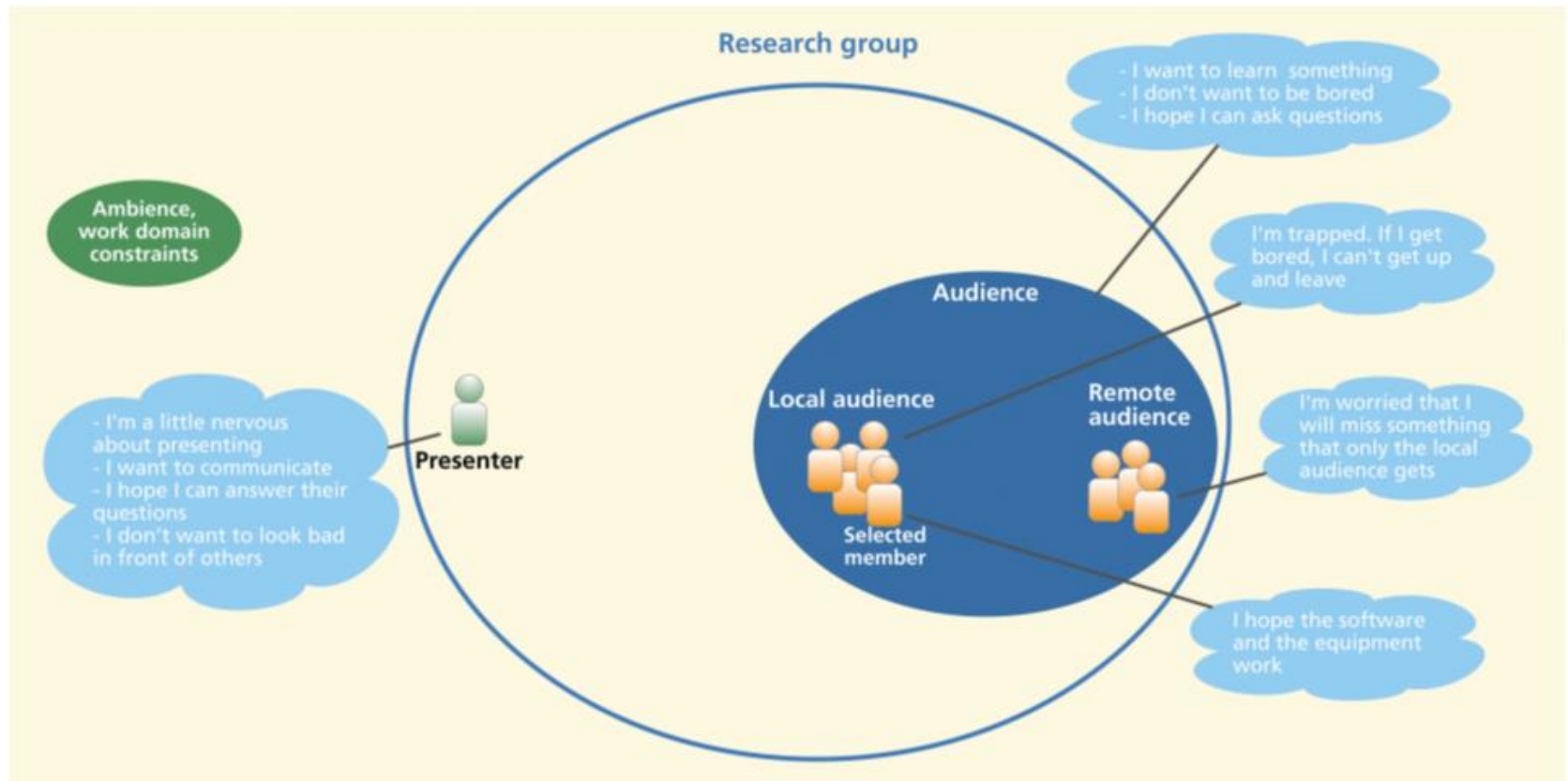
Example – Step 1

Slide show example



Example – Step2

Add concerns and perspectives as node attributes

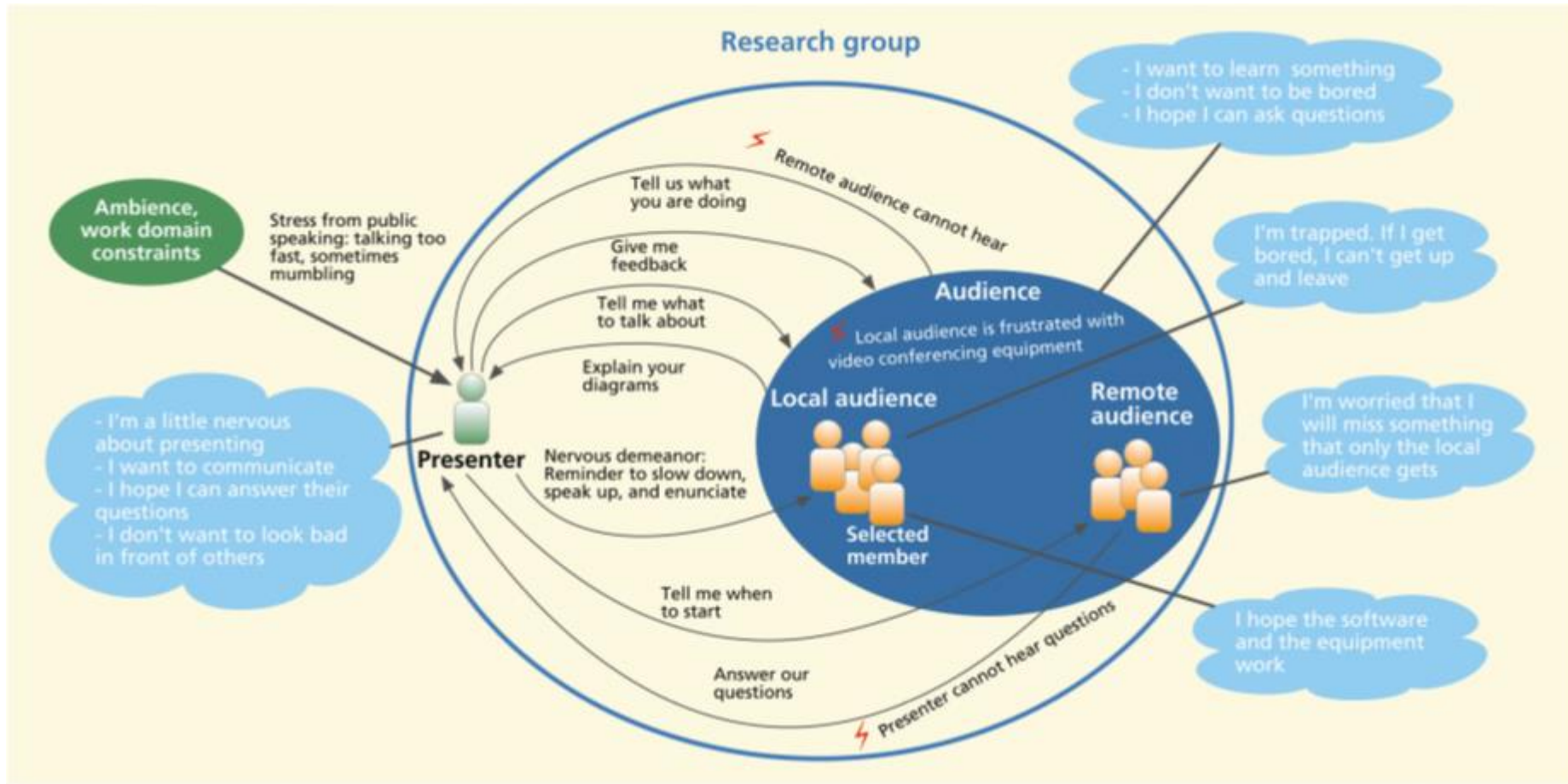


Work Role Influences

- Inter-role **professional** and **personal relationships** influence personal feelings
- **Work domain power** influences
- **System related**; e.g., poor performance
- **Work environment ambience**; friendly, stressful,
- **Work domain constraints**; policies, standards, ...
- **Barriers** that may prevent change
- To diagram: create **arcs** between nodes to represent influences
 - Label, use arrows to indicate direction

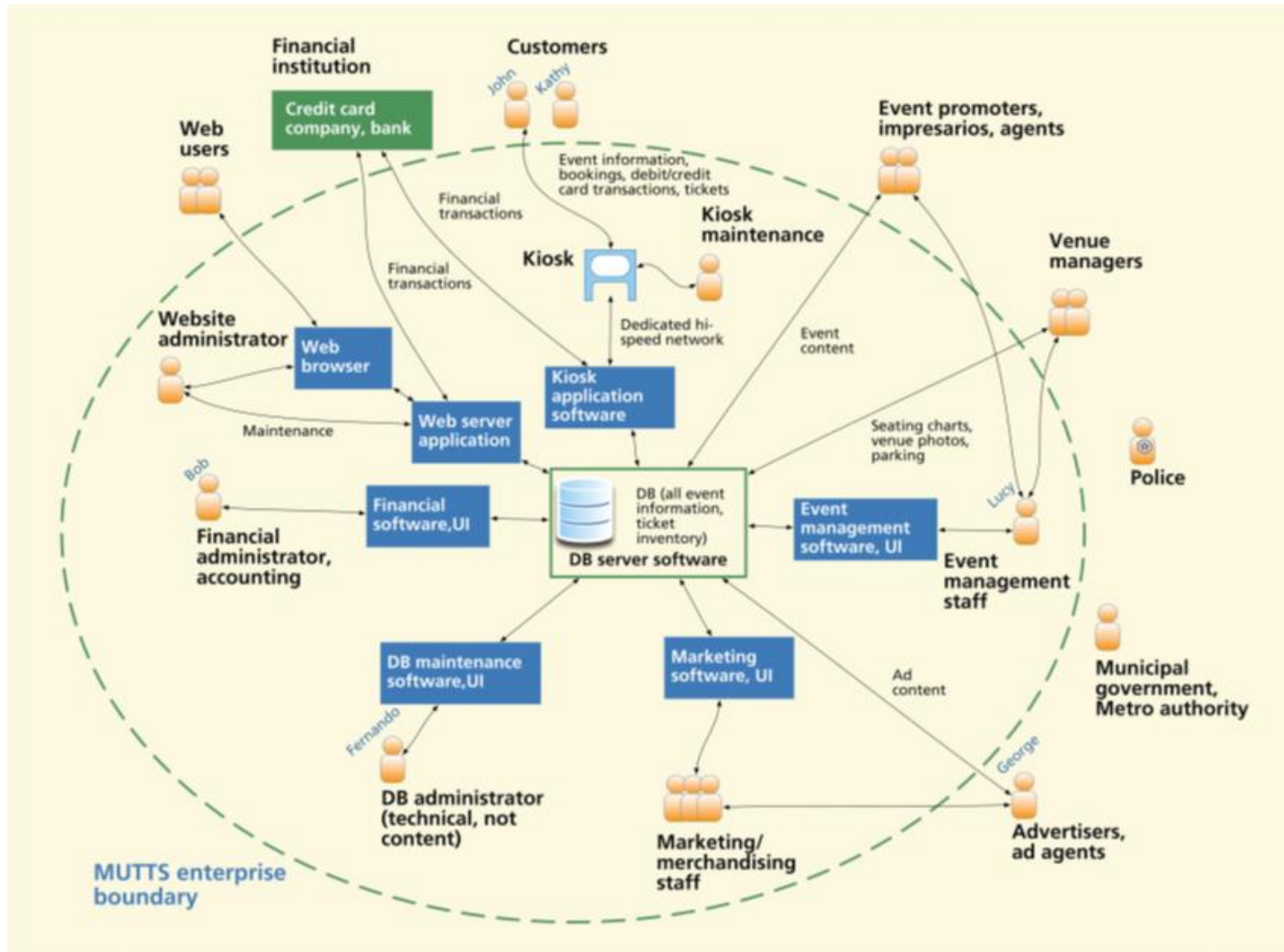
Example – Step 3

Add inter-node influences



Usage Models

- **Continue** to develop the **work flow model**
 - Scope is entire **work practice** and **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
- **Task structure** models
- **Task interaction** models



Task Structure Models

- Tasks vs. functions
 - **Task**: something a **user does**
 - **Function**: something **system does**
 - Example, information is displayed (system); viewed (user)
- Hierarchal task analysis (HTA)
 - Break work down into **tasks, subtasks, actions**
 - **Descriptions** and/or **graphical** representation
 - Overall task **inventory**
 - **Individual** task **analysis**

The HTA Approach

- **Iterative decomposition:**
 - **Goal:** the user's desired work objective
 - **Task:** how the goal can be fulfilled.
 - **Hierarchy** of sub-tasks to accomplish the task
 - **Actions:** what the user does to perform the sub-tasks. This is the lowest level description of the user's actions.
 - **Plans:** various **flow scenarios** to describe what **conditions** that a sub-task and/or action shall be performed

Withdrawing Money from ATM

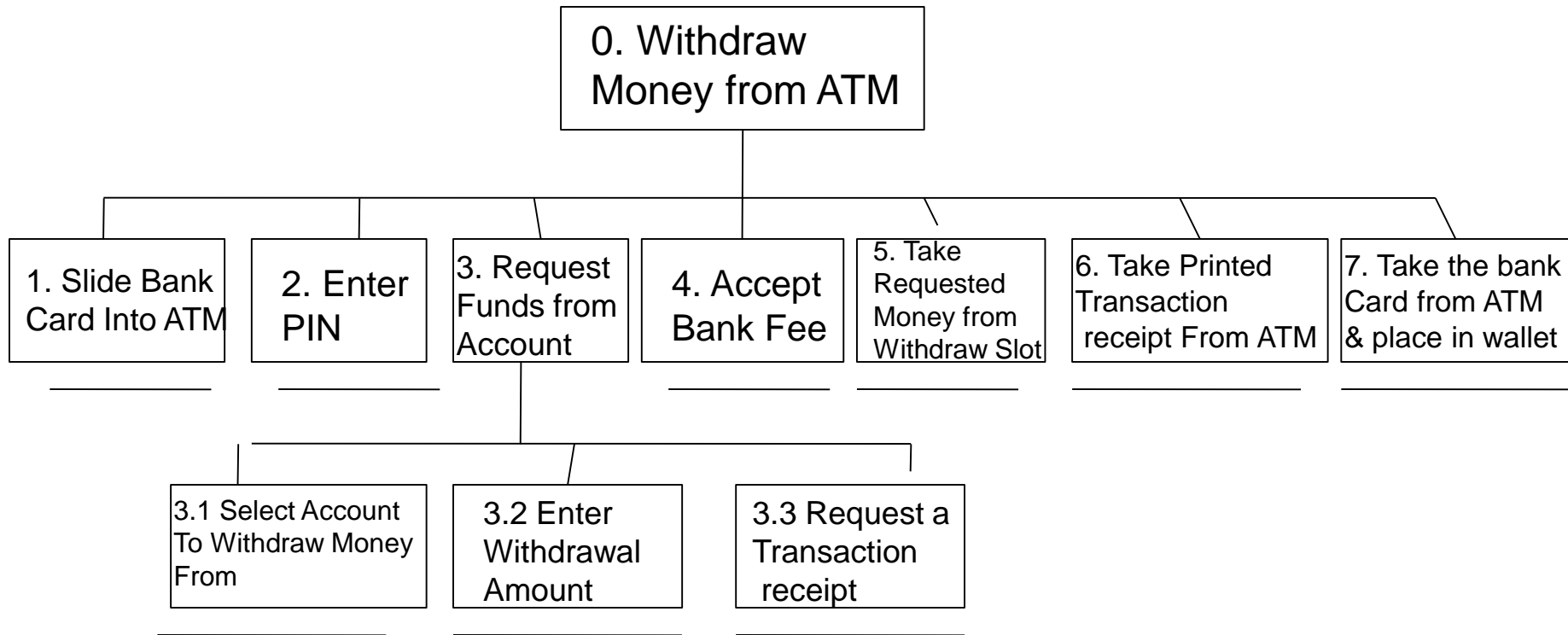
0. Withdraw Money from ATM

1. Slide bank card into ATM
2. Enter PIN
3. Request Funds from Account
 - 3.1 select account to withdraw money from
 - 3.2 enter amount of money requested for withdraw
 - 3-3 request a transaction receipt
4. Accept bank fee
5. Take requested money from the withdraw slot
6. Take the printed copy of the transaction receipt from the ATM
7. Take the bank card from the ATM and place back in wallet

Plan 0: do 1-2-3-4 in that order; 5-7 in any order. When the transaction receipt is requested do 6..

Plan 3: do 3.1-3.2 in that order. When a transaction receipt is desired do 3.3 after 3.2.

Graphical Version



Practice

Check-in for a Flight Scenario

A passenger walks up to an airline kiosk at the airport to check-in for her flight. After selecting the check-in option the passenger must identify herself and the flight. The system offers the user the option of entering either their flight confirmation code, frequent flier number, or to swipe their credit card. After finding the user's flight record the system asks the passenger to select the passengers for the flight. For each selected passenger the user is offered the options to select or change seats and to check bags. For each passenger the user may select a new available seat and/or enter the number of checked bags. After all selections and changes have been completed for all passengers, the system requests the user to pay the checked bag fee with a credit card. The system prints the baggage fee receipt, the baggage tags, and then prints the boarding passes. The passengers are checked in.

Check-in to a Flight

0. Check-in to a Flight

1. Select the check-in option
2. Identify a passenger and the flight
 - 2.1 enter flight confirmation code
 - 2.2 enter frequent flier number
 - 2.3 swipe credit card
3. Select a passenger
 - 3.1 select or change seat
 - 3.2 check one or more bags
4. Pay checked bag fee
5. Select print
 - 5.1 the baggage receipt is printed
 - 5.2 the baggage tags are printed
 - 5.3 the boarding passes are printed
6. Take all of the printed records

Plan 0: do 1-2, do 3 for each passenger, do 4-5-6

Plan 2: do either 2.1, 2.2, or 2.3

Plan 3 : optionally do 3.1 then 3.2

Plan 5: optionally do 5.1, then 5.2-5.3

Task Interaction Models

- Usage scenarios
- Step-by-Step
- Essential use cases

Usage Scenarios

- **Narrative** task interaction models
- **Stories** about
 - **Specific people** with work **goals**
 - **Performing work** activities
 - Within a specific work **environment**
 - **User actions, system responses**
 - **Barriers** encountered
 - As if it were a **transcript** of a real usage occurrence

Step-by-Step

- More direct and less story oriented
- Show **detailed steps of task performance** in textual representation
- Includes **temporal ordering** of actions and activities
- Mostly **linear** but can show looping and branches
- Template:
 - Task name
 - Task and step goals
 - Task triggers
 - Task step narratives

Step-by-Step Example

Task name: Find RIT hockey tickets for a given date (performed by ticket seller on behalf of ticket buyer)

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

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

1. Ticket Buyer: Tells ticket seller about general goal of wanting to find a hockey ticket for next night (Friday)
2. Ticket Buyer: Asks about available seats
3. Ticket Seller: "There are reserved seats and general admission seats"
4. Ticket Buyer: Not enough information yet to decide on location and prices. Asks about examples of different types.
5. Ticket Seller: Gives examples

Step goal: Try to narrow it down

6. Ticket Buyer: Asks what seats are available in section reserved seats 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 what section what you like")

And so on.....

Essential Use Cases

- **Derived** from **software use cases**
- A **more abstract** than step-by-step task modeling
- Describes a **single task** for a user **goal**
- “Essential” -> describe only the **essential task thread** for the user
- Tasks structured in two alternating scenarios ...
 - User actions
 - Corresponding system responsibilities

Essential Use Case Example

Pay for Ticket

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

- Information object – **work domain objects** shared by users and the system
 - Objects, their attributes and relationships
 - E.g. “ticket”
- Analyze task interaction models to indentify information objects
 - “Look for nouns”
- Web apps = “information architecture”

Work Environment Model

- Define the milieu in which work gets done
- How related work **environment** factors **affect tasks** (social model)
- Include constraints, **artifacts**, and **physical** models
 - **Artifact** – physical or electronic things that get passed around in the business process work flow
 - E.g., confirmation email, paper ticket
 - **Physical** – the physical environment that supports the work
- **Add** them to the **work flow model**

Now What?

- Perform design-informing modeling as needed to understand work ...
 - Roles, flow, environment, and tasks
- **Merge models – one flow diagram**
- Leverage the WAAD