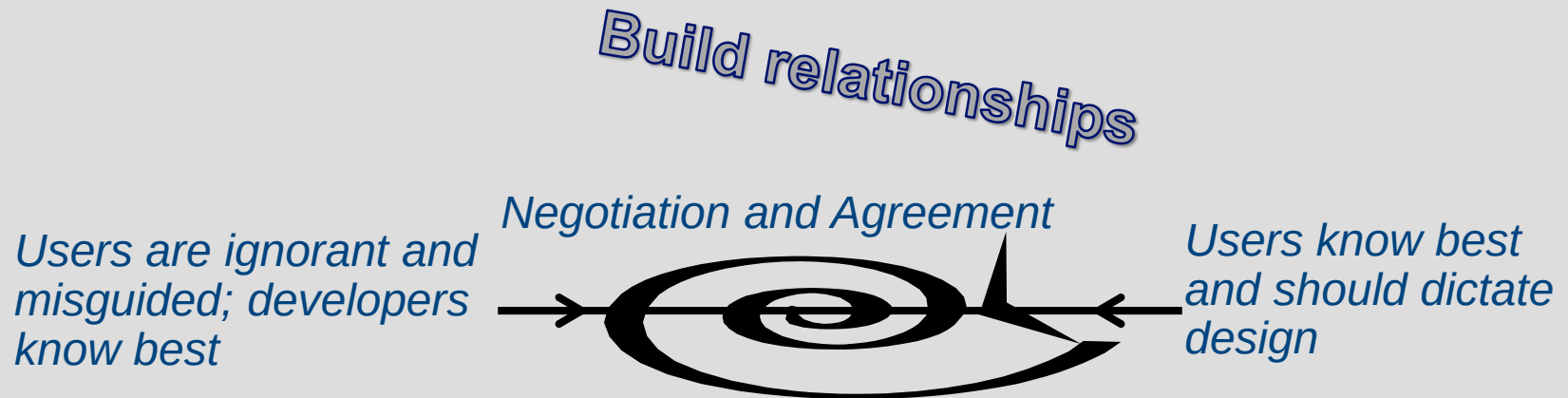


Requirements Elicitation

Requirements Elicitation - Discovery

- A **conversation** between stakeholders, users, and software engineers about requirements
- A **negotiation** to achieve mutual understanding and consensus
- A **documentation** of joint understanding and agreements



A Catalog of Elicitation Techniques

- Interviews
- Surveys
- Apprenticing
- Ethnographic studies
- Visual modeling
- Requirements workshops
- Brainstorming
- Literature and competition research
- Document archeology

Apply the 5W+H Heuristic – who, what , where, when, why, (how)

Interviewing Synopsis

- Common, **natural**, but may have **limitations**
- Model as a **decision tree** – problem, question, answer, decision, repeat to understand requirements
- What can possibly go wrong?
 - Wrong questions, wrong order, side branches
 - Ambiguity
 - Interviewees may not know or communicate well
 - Interviewer's conformation bias and intuition
- Create an interview plan!
- **An Example (Separate slide set)**

Interviewing Synopsis (cont)

- **Prepare** questions **but refine** as you learn
- Types of questions – user oriented, more general; ask “*why*”, get to the essence
- **Avoid leading questions**; e.g., “would feature X be useful?”
- **Encourage story telling**, discourage design
- The interview process
 - Introductions, **setup**, put the user at ease
 - **Ask** questions, *listen*, **feedback** understanding
 - Monitor **group dynamics**
 - **Document** responses, analyze, determine next steps

Advantages of Face-to-Face Communication

- The **interviewer** is in **control**, can direct focus
- **Observe** verbal and non-verbal emotions and behaviors
- Reinforces memory by **repetition**
- Minimizes ambiguity by repetition

Confirmation Bias

- **Tendency to confirm** one's **preexisting beliefs or hypotheses**
- **Interpret ambiguous evidence** as supporting their existing position
- **Biased search for information:** the phrasing of a question can significantly change the answer.
- **Biased interpretation of information:** versus in a neutral objective manner.
- **Biased memory:** may still remember evidence selectively to reinforce their expectations.

Surveys Versus Interviews

- Surveys can be an **alternative or supplement to interviews**
 - **Large number** of stakeholders /users
 - **Difficult to meet** stakeholders in person
 - Not a more reliable source of data available
- Surveys **seem inexpensive and easy** but...
 - Often require follow-up clarification that adds time and cost
 - Reliability and value of information collected is variable even with follow up
 - Everyone suffers from survey fatigue

Surveys Summary

- Advantages:
 - Reach a large number of people
 - Easy to do, provides quantifiable data
- Cautions:
 - Survey fatigue ... so
 - Risk of low response rate, extremes bias, unreliable data
 - No follow up
- Plan the survey
 - Identify the questions and data to be collected
 - Identify target population and sampling groups
 - Set a deadline, keep it simple
 - On-line tool
 - How will the data be analyzed; follow up?

Apprenticing

“Nobody can talk better about what they do and why they do it than they can while in the middle of doing it.”

– Beyer and Holtzblatt, *Contextual Design: Defining Customer-Centered Systems*

- **Serve as an apprentice to the user to learn their job** (assuming existing or similar system)
- **Observe**, ask **questions**, **do** some of the work
- **Normal** and **exceptional** behavior
- Tour work environment
- Observe and participate over time and multiple users
- Caution – observers presence may impact user's behavior

Ethnographic Studies

- The **methodical study of *group behavior* in the context of *cultural* group settings**
 - Culture – pattern of human interaction, beliefs, values, social behavior, material status
- A combination of observation, interviewing, experiments, and survey techniques
- **Real** (work setting) **and contrived** situations
- Often employed by marketing and usability (human factors) organizations to study what people think about or interact with products and services
 - **Focus study groups** – “this pizza tastes like cardboard”; **examples?**
 - Source of data for defining personas

Visual Requirements Modeling

- Graphical description of system functionality
- **Communicate and validate functionality** with stakeholders
- **Visual, intuitive**
- Explore user/system interaction and usability issues
- **Storyboards, Wireframes, Prototypes**
- Exploratory or evolutionary



DON'T OVERSELL – STAKEHOLDERS TEND TO SEE PROTOTYPES AS FINAL SOLUTIONS TOO SOON

Requirements Workshops

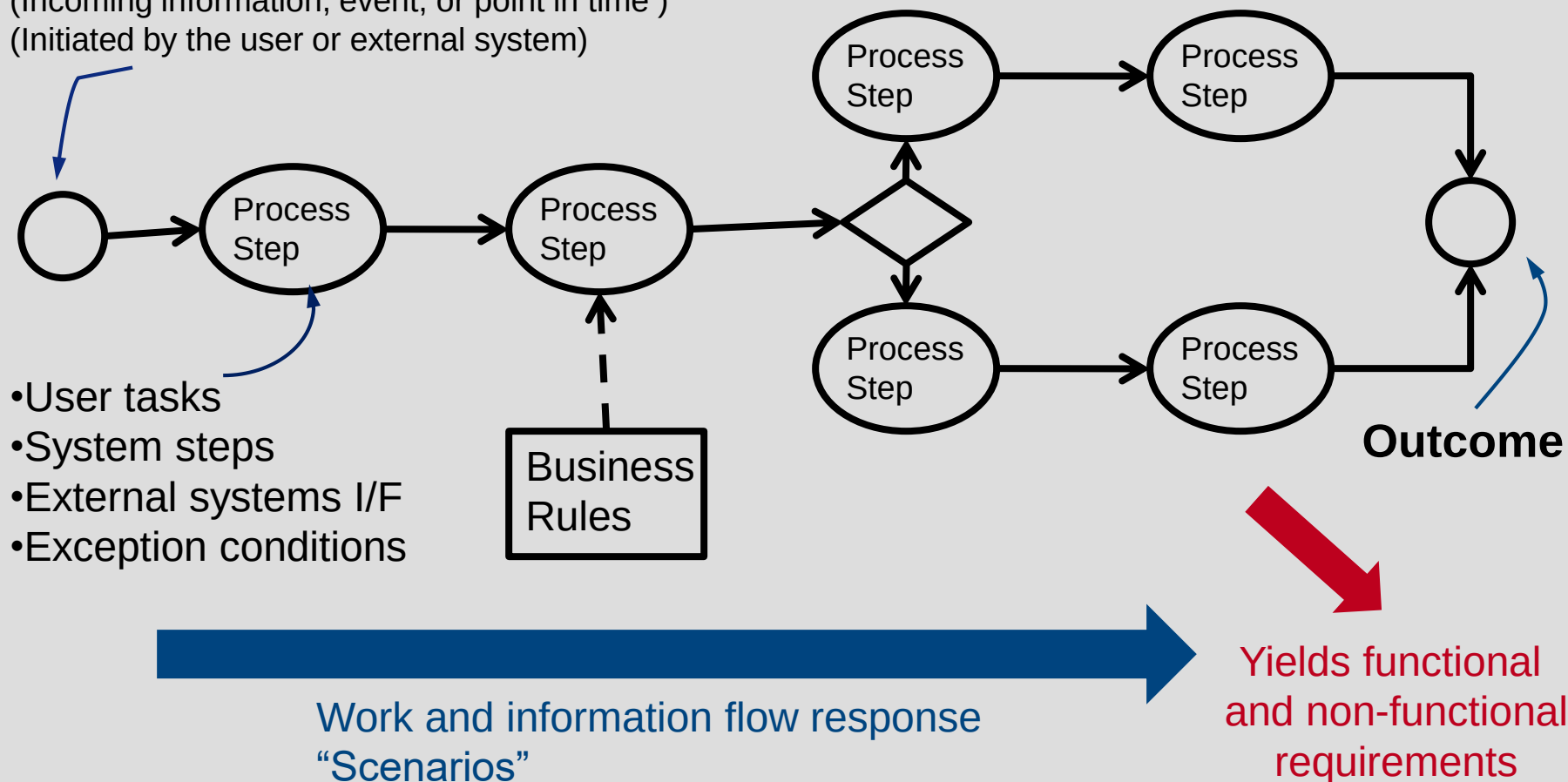
(Structured Conversations)

- **Structured collaborative meetings** to elicit requirements
- The goal – define and agree on **system requirements** in the context of a **business domain process** model
- Workshop agenda – elicit and **analyze system events** and the **corresponding business workflow responses**
- Key stakeholders and users, meeting agenda and roles, users walkthrough workflow steps to respond to an event

The Business (Domain) Process Model

Trigger event:

(Incoming information, event, or point in time)
(Initiated by the user or external system)



Brainstorming – Idea Generation

- Use the **group effect to generate good ideas** for innovation and to solve problems
 - “The Wisdom of Crowds” –diverse, independent, aggregation
 - But – “Decades of research have consistently shown that brainstorming groups think of far fewer ideas than the same number of people who work alone and later pool their ideas.”
- **Rapidly generate** as many **ideas** as possible
 - Don’t interrupt the creative flow
 - Suspend judgment, evaluation, and criticism
 - Don’t stop to clarify or seek clarification
 - Okay if some ideas are wild, crazy or impractical

After the Brainstorming Session

- **Evaluate ideas**
 - Some worthless, but they will have served their purpose by seeding other, more practical, ideas
 - Keep the best and (if feasible) turn them into requirements
 - As a group vote on or score ideas
- **Merge ideas**
 - Merge half-formed ideas into an invention
- **Evolve half-formed ideas** into true requirements
- **Investigate ideas** with additional elicitation techniques

Requirements from Market Research, Document Archeology, etc.

- **Literature reviews**
 - Business domain
 - Competing products – use them, reviews
 - Technology
 - State-of-the-art
 - Search patent databases – ideas, conflicts, new IP opportunities
- **Legacy system and document archeology**
 - Existing specifications, manuals, help, FAQ, etc.
 - Reverse engineer engineering artifacts

Same kinds of questions you would ask if interviewing stakeholders

Capture Requirements Electronically

- Use computer technology to discover, capture, discuss, and validate requirements
 - Web searching, social networking, email, on-line surveys, ...
- **Manage** the flood of **requirements/search results by organizing** via some convention using a tool...
- Multi-media is an effective record of elicitation sessions
 - Aids recall and sharing
 - Be aware of participant self consciousness at first

No matter what format you use, WRITE IT DOWN!