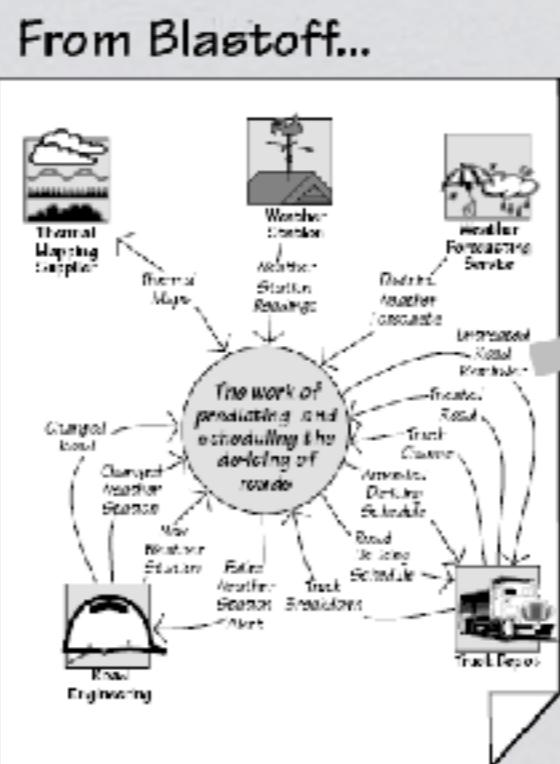


Business Use Cases



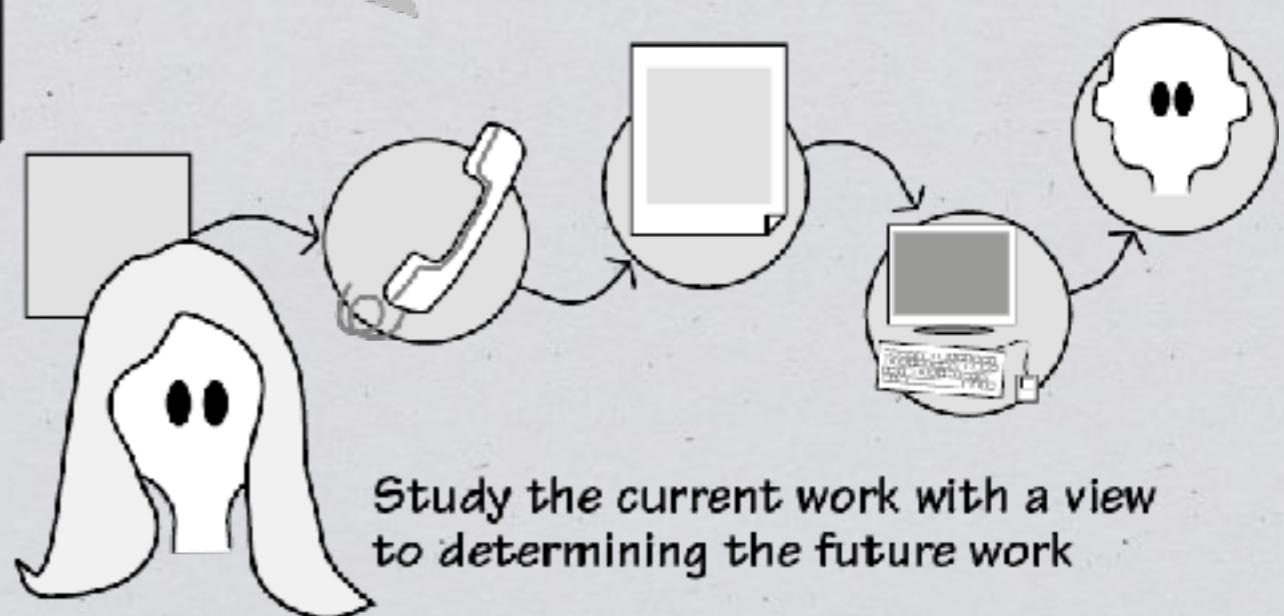
Business events are determined using the triggering data flows from the adjacent systems on the context diagram. The business use cases are the work's responses to the business events, and these are studied until the analyst understands the way the work functions.



Context diagram showing scope of the work

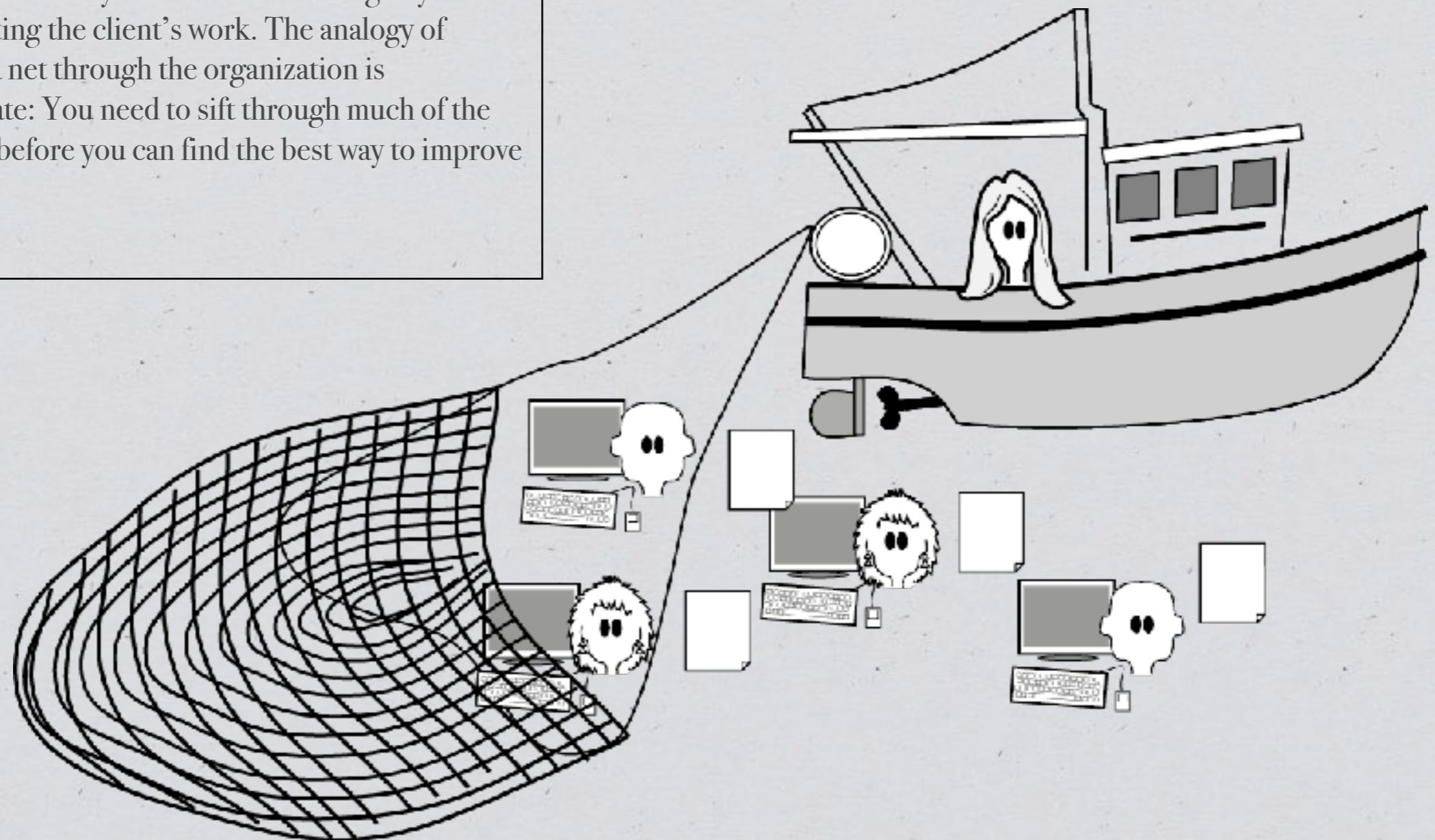
- Business Use Cases**
- 1.
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.

For each business use case...



Trawling for Knowledge

The business analyst trawls for knowledge by investigating the client's work. The analogy of running a net through the organization is appropriate: You need to sift through much of the business before you can find the best way to improve it.



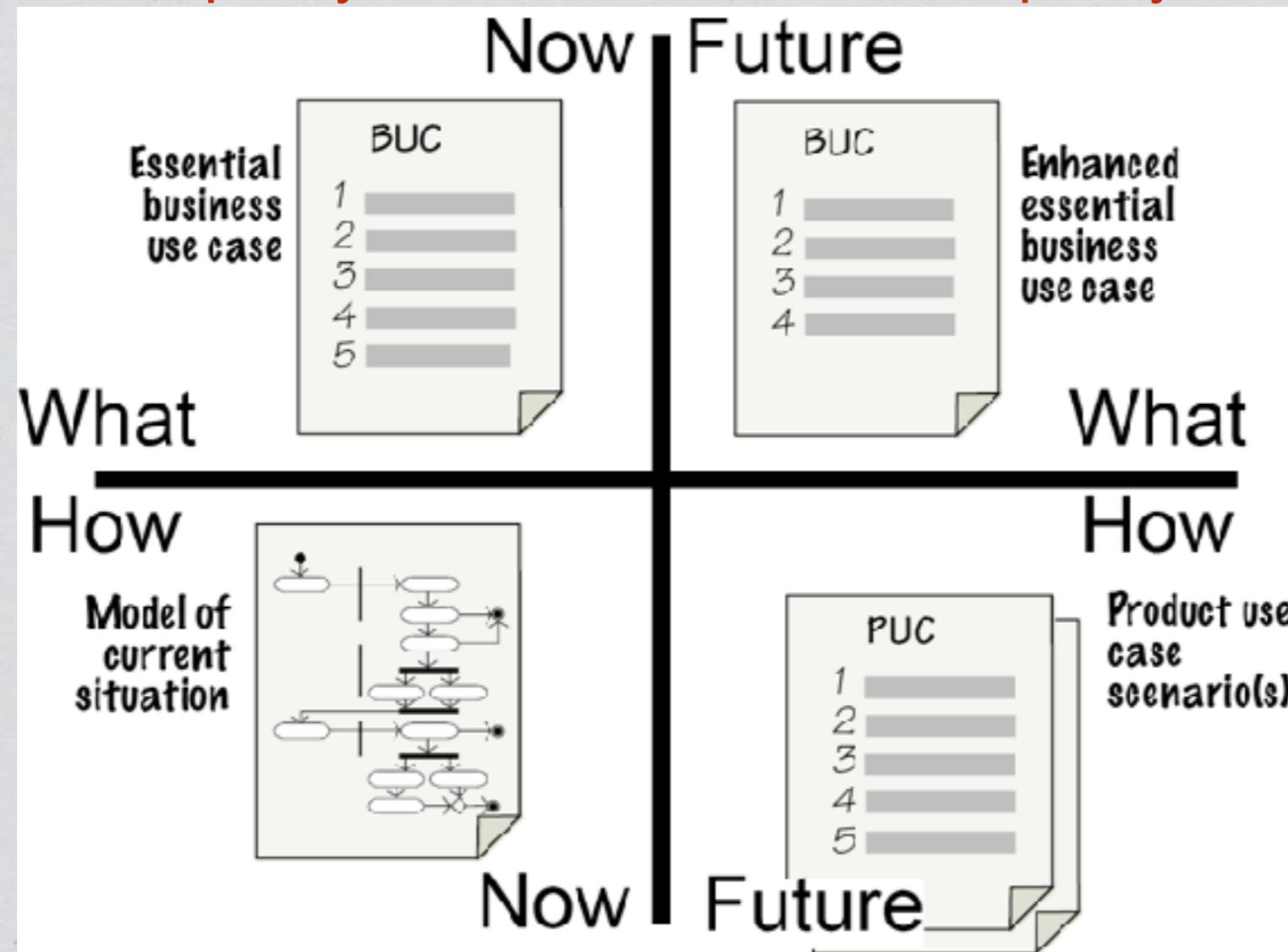
The job of the analyst

- ♦ He has to inspect the work, interview the business stakeholders, understand what they are saying, and then translate that knowledge into a form that can be communicated to and understood by the developers.
 - Observe and learn the work, and understand it from the point of view of the owner.
 - Record the results in the form of stakeholder-understandable analysis models.

Brown Cow Model

Current
business policy/essence

Future
business policy/essence

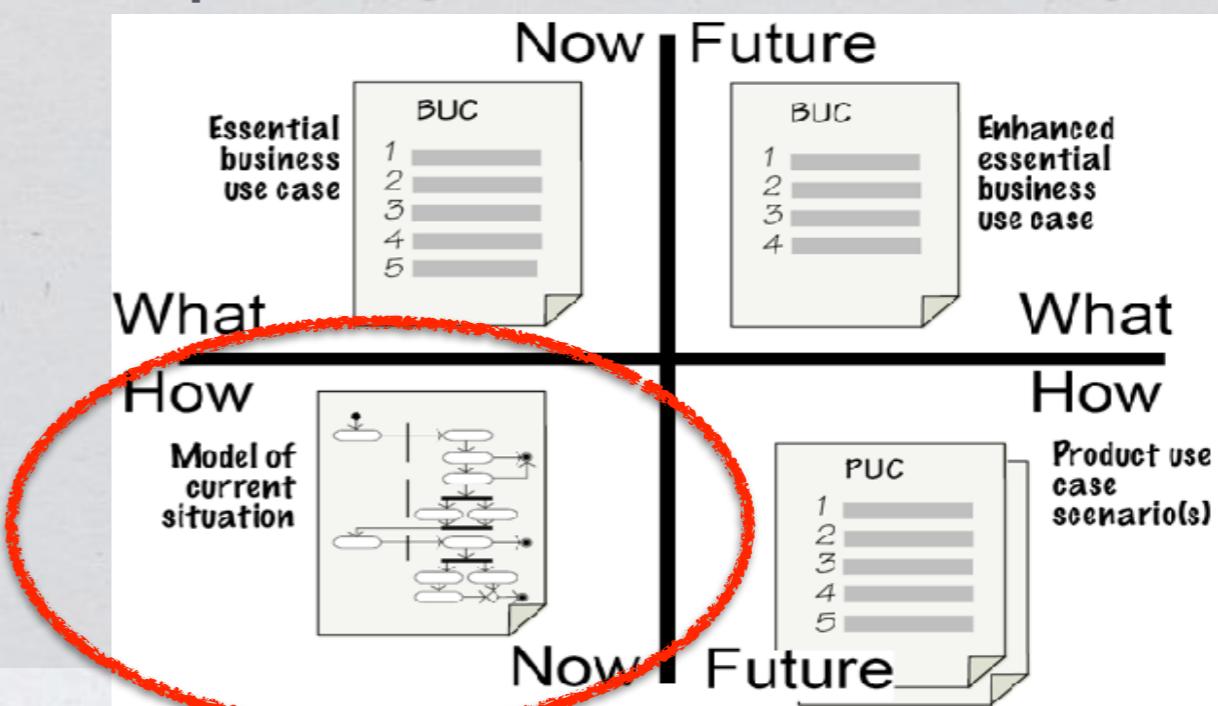


Current
implementation

Future
implementation

Brown Cow Model

- ◆ **How-Now:** Current Implementation of the work, including people, technology, processes, etc.
- ◆ **What-Now:** Current essence (business policy), technologically neutral.
- ◆ **What-Future:** The business as your owner wants to have it, but still without the technology that might be used to implement that business.
- ◆ **How-Future:** How you implement the future business.



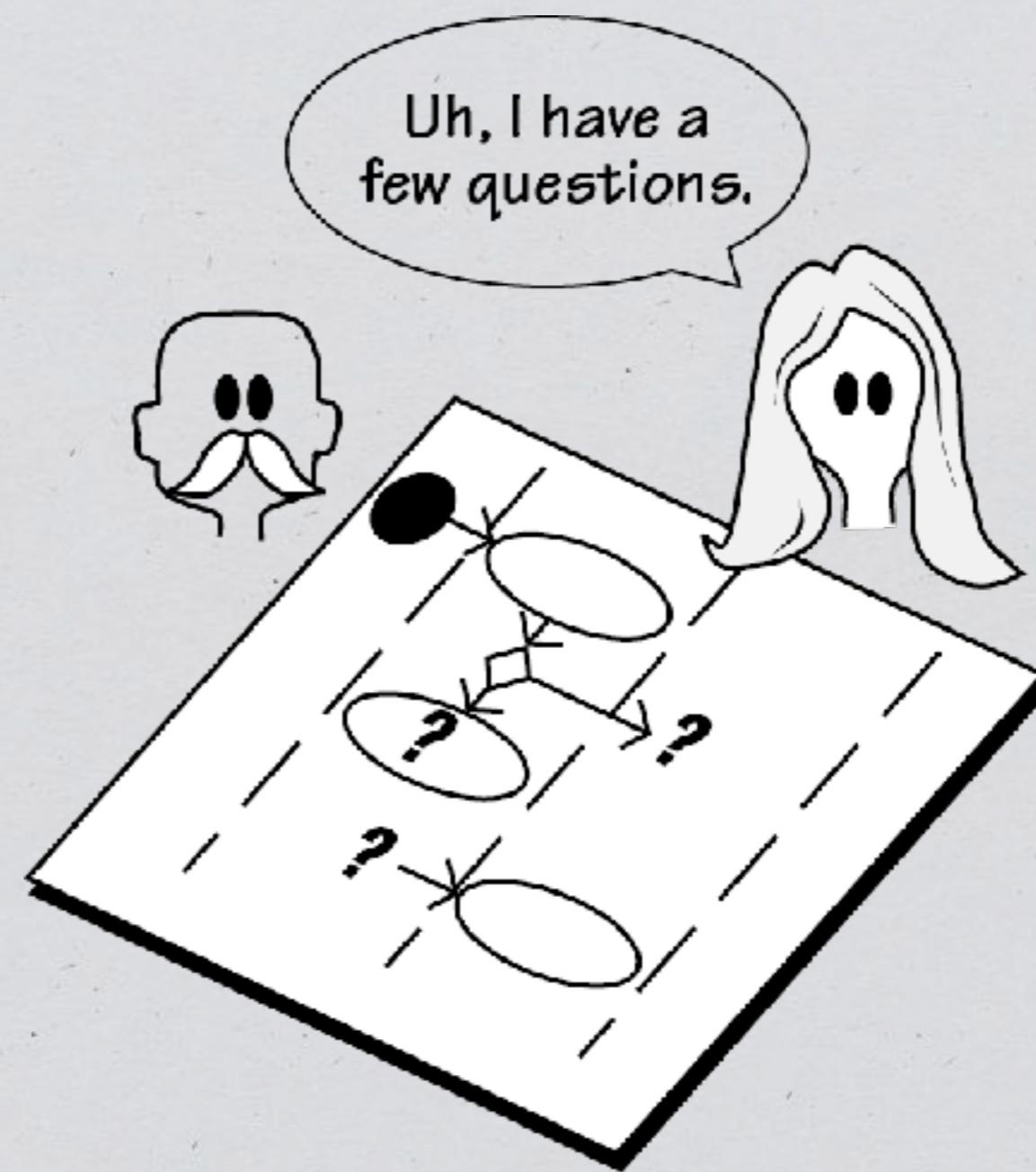
Models of How-Now

♦Building models as a way of investigating the work is best done when you need to :

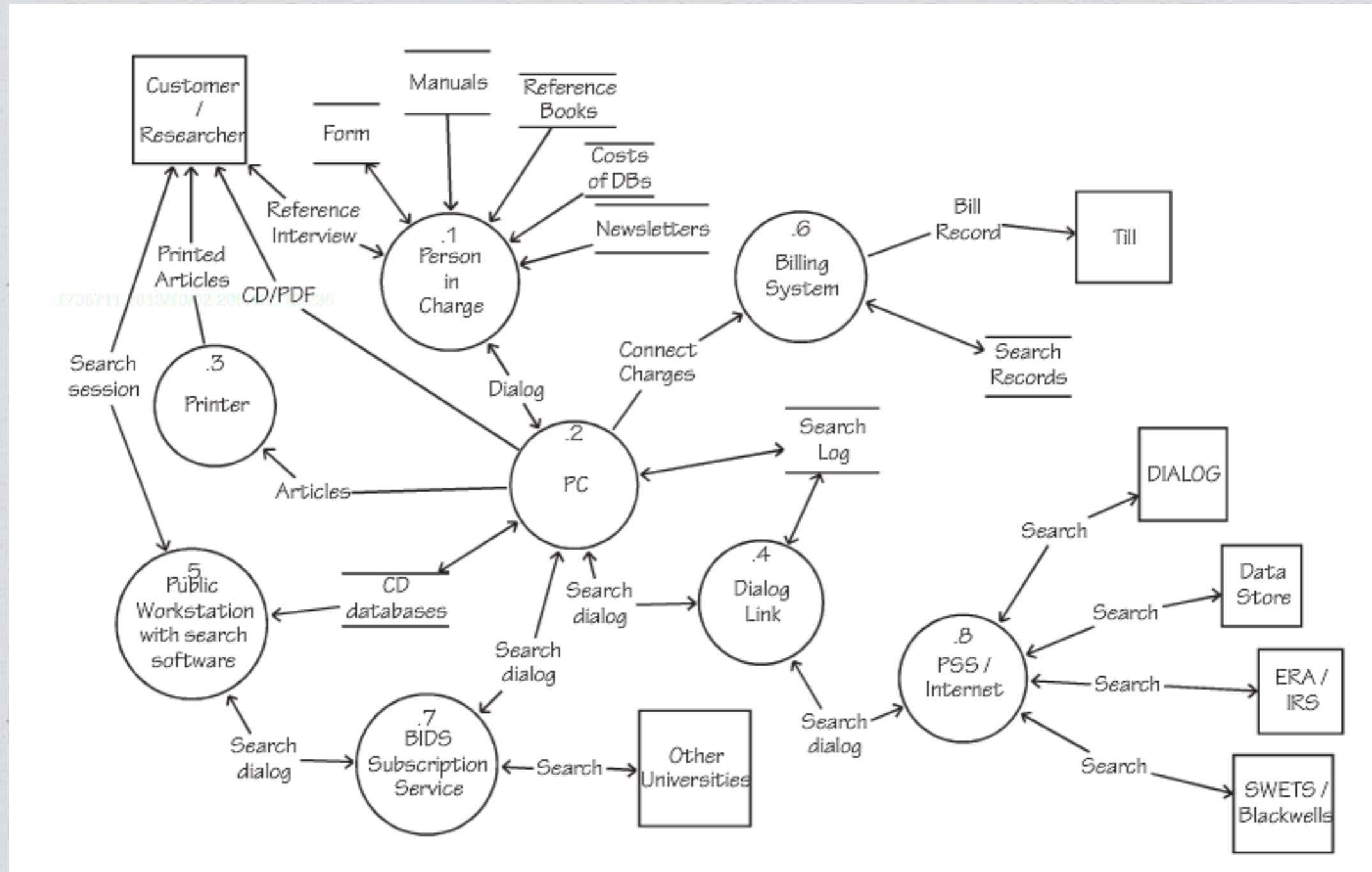
- understand a medium-to-large work area for which no documentation exists.
- This technique is also used when the current users struggle to give you an idea of how the work fits together.
- It is also useful when you know that there will be a significant legacy from the existing work.

Building Models

Knowing where to ask questions, and which questions to ask, is almost as useful as knowing the answers. If your model has flows going nowhere, processes without inputs, read-only or write-only data stores, or other breaches of the modeling conventions, then you need to ask your stakeholders more questions about those aspects of the work.

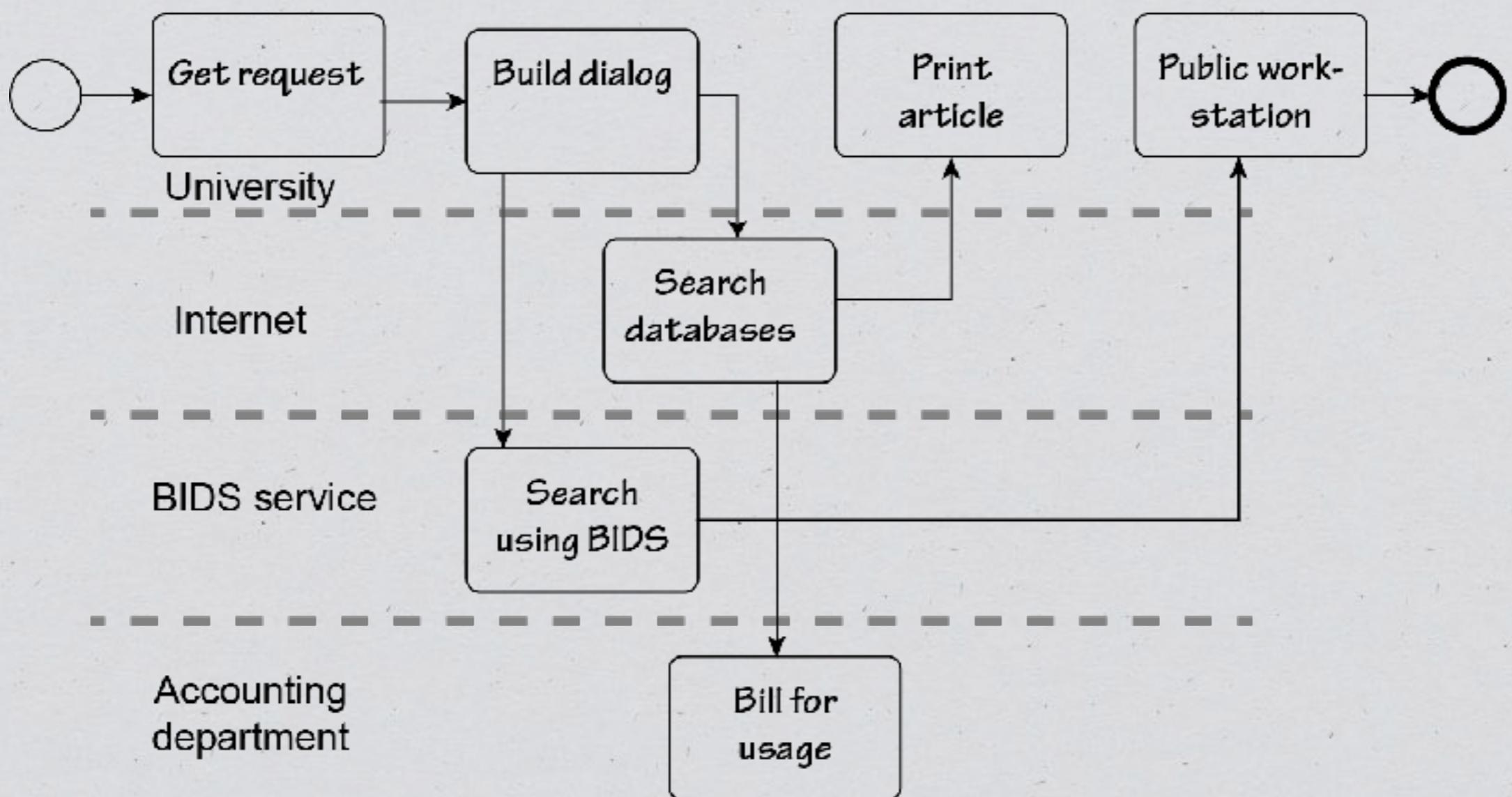


Data Flow Model



Process for interrogating commercial databases. This model shows the technology used for the task. As the user described the work, the modeller modelled and demonstrated their understanding. This model uses conventional data flow notation. Most process models would do the job equally well, so use whichever model you are most familiar with.

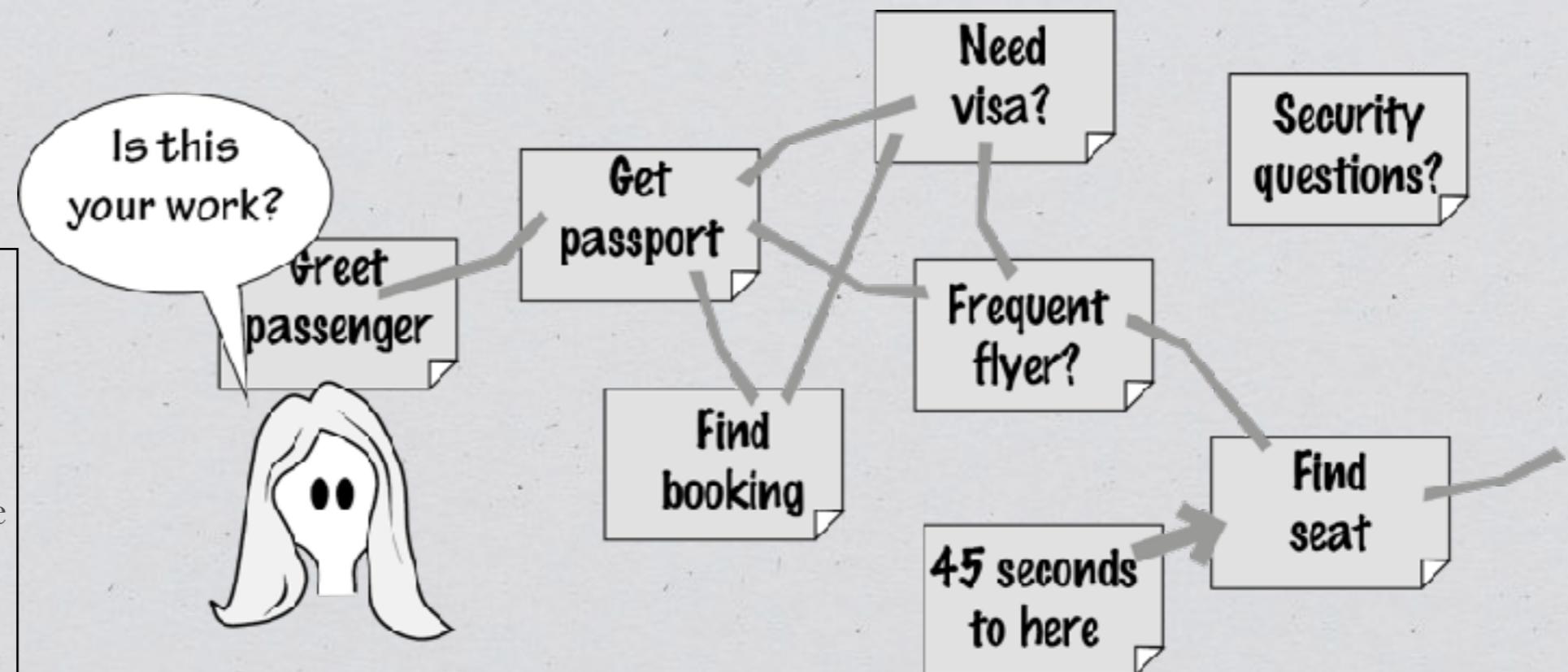
Modelling - Activity Diagram



A UML activity diagram showing the same piece of work. Business analysts should use whatever models they feel most comfortable with.

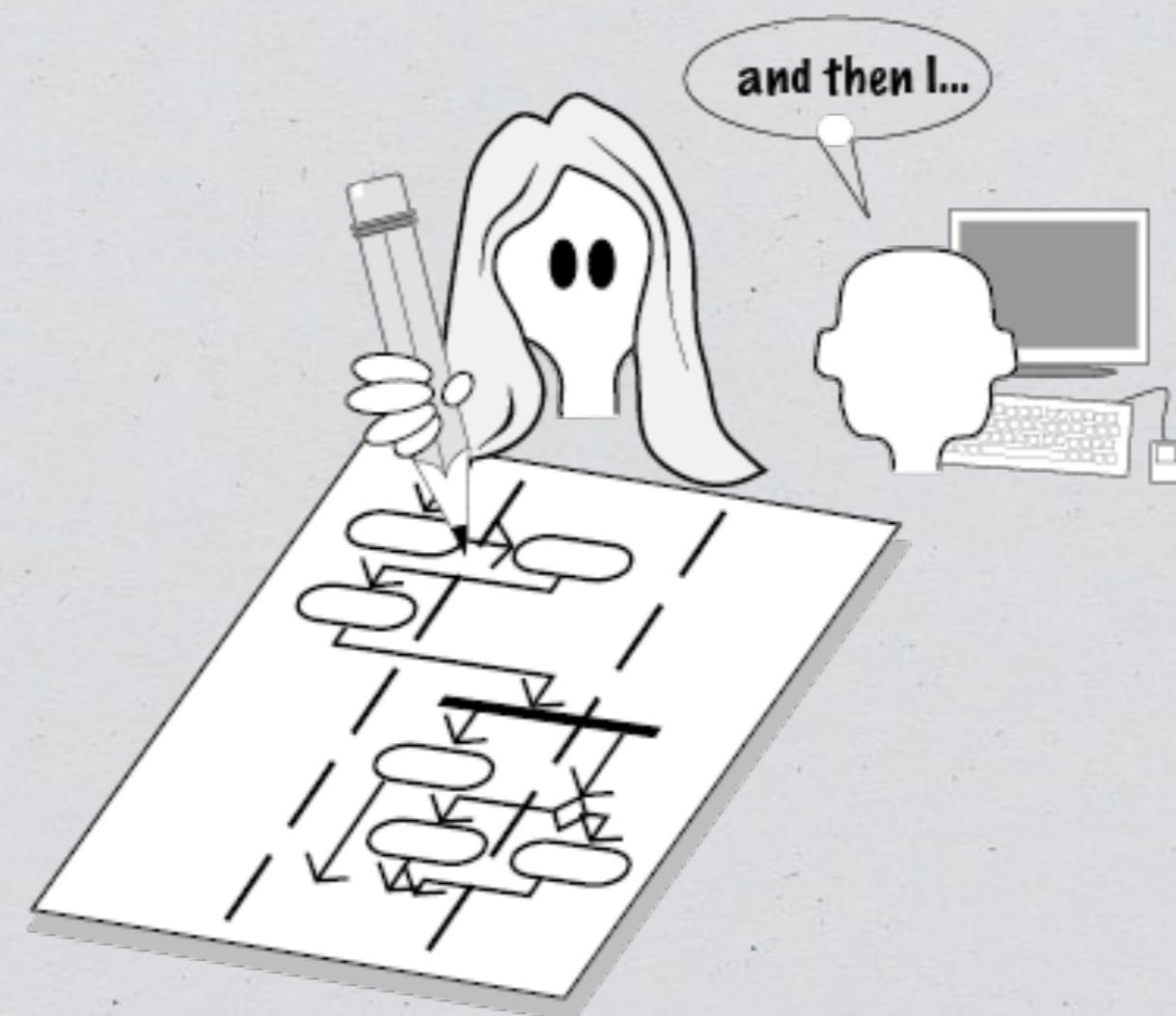
Quick and Dirty Process Modelling

With quick and dirty process modeling, the business analyst uses Post-it notes to build an informal model of the work. Large notes are stuck on the wall and linked by masking tape. Naturally, interested stakeholders are partners in this modeling activity.



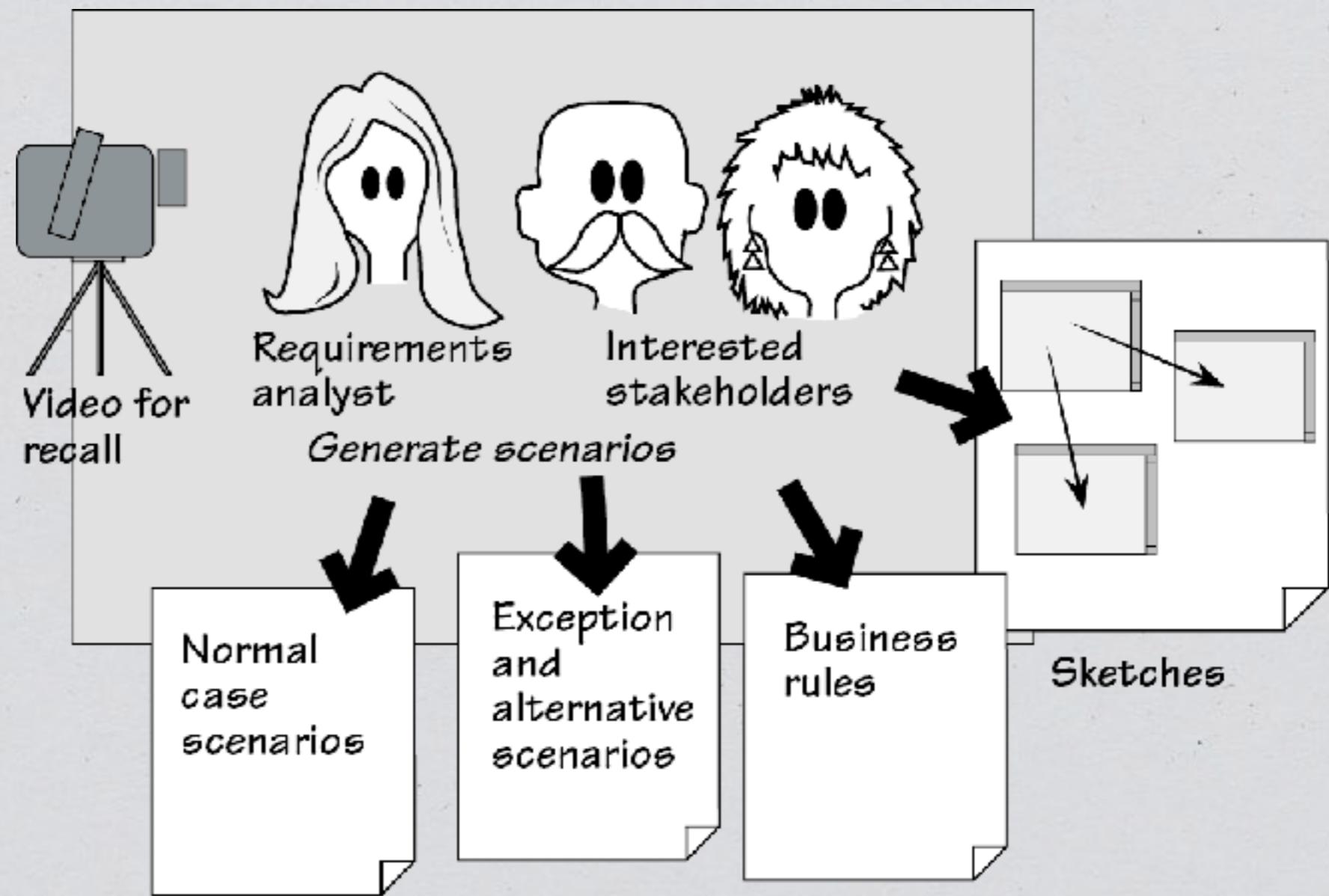
Apprenticing

The requirements analyst learns the work while sitting at the user's desk, sometimes building models of the work while learning it.



Business Use Case Workshops

The business use case workshop records the proposed functionality using scenarios and sketched prototypes. The workshop serves as a forum for interested stakeholders to communicate effectively, express their understanding, ask questions, and give their aspirations for the work.

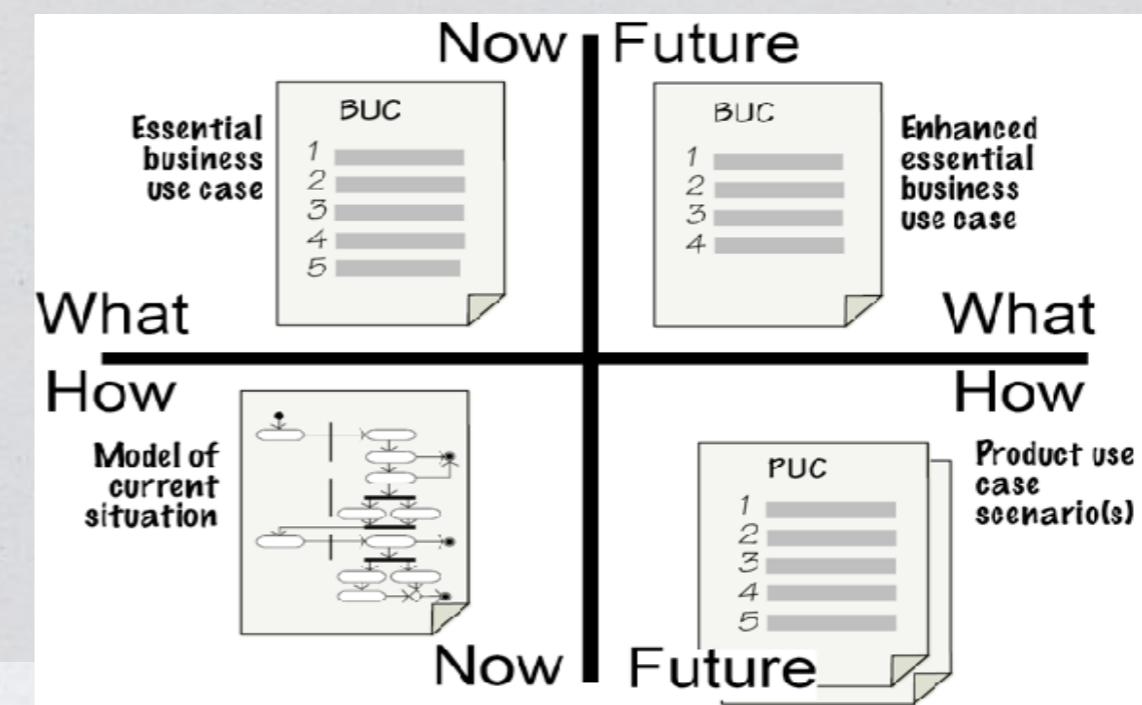


Workshop outcomes

- ◆ Desired outcome for the BUC
- ◆ A normal case scenario that describes the work done by the BUC
- ◆ Exception scenarios describing what can go wrong and what the work does to correct them (these can be postponed until later if desired)
- ◆ The business rules are management prescriptions:
e.g., The maximum length of a truck driver's shift is 5 hours.
- ◆ Sketched prototypes used to help stakeholders visualize the business use case—these throwaway sketches are optional and are not intended to be kept beyond the requirements phase

Interviewing Stakeholders

- ◆ Some requirements analysts draw up a questionnaire and send it to the stakeholder in advance of the interview
- ◆ Stakeholders should not remain completely passive during the interview (Feedback loops are useful)
- ◆ Keep the brown cow model in mind..



Interview Guidelines

◆ Guidelines:

- Set the interview in context
- Limit the duration of the interview to the time stated in the agenda
- Have business use cases serve as an anchor for the interview
- Ask a question, listen to the answer, and then feed back your understanding
- Draw models and encourage the user to change them
- Use the stakeholders' terminology and artifacts, both conceptual and real.
- Keep samples or copies of artifacts and log them for future reference
- **Thank the stakeholders for their time and tell them what you learned and why it was valuable**
- Write down what you were told. We guarantee you'll have more questions.

Business Analyst: "What happens when your engineers install a new weather station?"

Chief Engineer: "The engineers let us know where the new weather station is located, and we keep a record of it."

BA: "How do you keep a record of the new weather station?"

CE: "I'll show you the spreadsheet that we use; here it is."

BA: "Thank you. I'd like a copy of this weather station spreadsheet. I see that you keep track of the weather station number, geographical coordinates, and installation date. What else do you keep track of?"

CE: "We have another computer system where we have the maintenance history for each weather station. There are some double entries, but that's the way it is."

BA: "Are there any other facts about the weather station that would be useful to you?"

CE: "Well, we would like to know the manufacturer and performance of each weather station."

BA: "What do you mean by performance?"

CE: "Which weather stations need the most maintenance. This would help in planning which new technology we spend our budget on. However we've never been able to do that in the past."

BA: "Would it be acceptable to you if you had a new system that integrates all the information about the weather stations, their maintenance, and their performance?"

CE: "What, you mean all on one screen?"

BA: "Yes, something that makes it possible for you to track a weather station and its lifetime performance."

CE: "That sounds marvelous, but we'd have to check it with some of the engineers."

BA: "Well, once I've made sure that I have all the facts about the weather stations properly defined, then I could do a quick mockup to show the engineers our ideas. How would that be?"

CE: "I like the idea."

BA: "Thanks for your time. I'll go back and review my notes and the samples you have given me, and I'll send you a brief summary of this interview. I might need to phone you with a couple of questions. Then I'll make an appointment to explore the mockup with the engineers. Is this approach all right with you?"

CE: "Yes it is. Thank you."

Reusable Requirements

- ◆ Why sending rockets to space is so expensive?
- ◆ The rocket cannot be reused.
- ◆ Cost: 1.5 billion per flight..



Reusable Requirements

- ◆ Many of our projects deliver similar products.
- ◆ That is, if you work for a finance house, then almost all of your projects will deliver some kind of financial system.
- ◆ Given that your organization has been doing this for a number of years, it is likely that someone, at some time, has studied a piece of work that is similar to yours and has written requirements for a product that is similar to yours.
- ◆ You don't have to do it all again when you can borrow from those who have gone before.

Prototypes and Sketches



Requirements prototypes are used to display the functionality of a potential product. The prototype is intended to prompt stakeholders to tell you whether you have understood the needed functionality and, as a result of “using” the prototype, to give you additional requirements suggested by it.

Prototypes and Sketches

- ◆ The product has not existed before, and it is difficult to visualize.
- ◆ The stakeholders for the product have no experience with either the kind of product or the proposed technology.
- ◆ The stakeholders are having trouble articulating their requirements.
- ◆ The requirements analysts are having trouble understanding what is required.
- ◆ The basic idea is to sketch some proposed product, and then reverse engineer the requirements from the sketch.

Low or High?

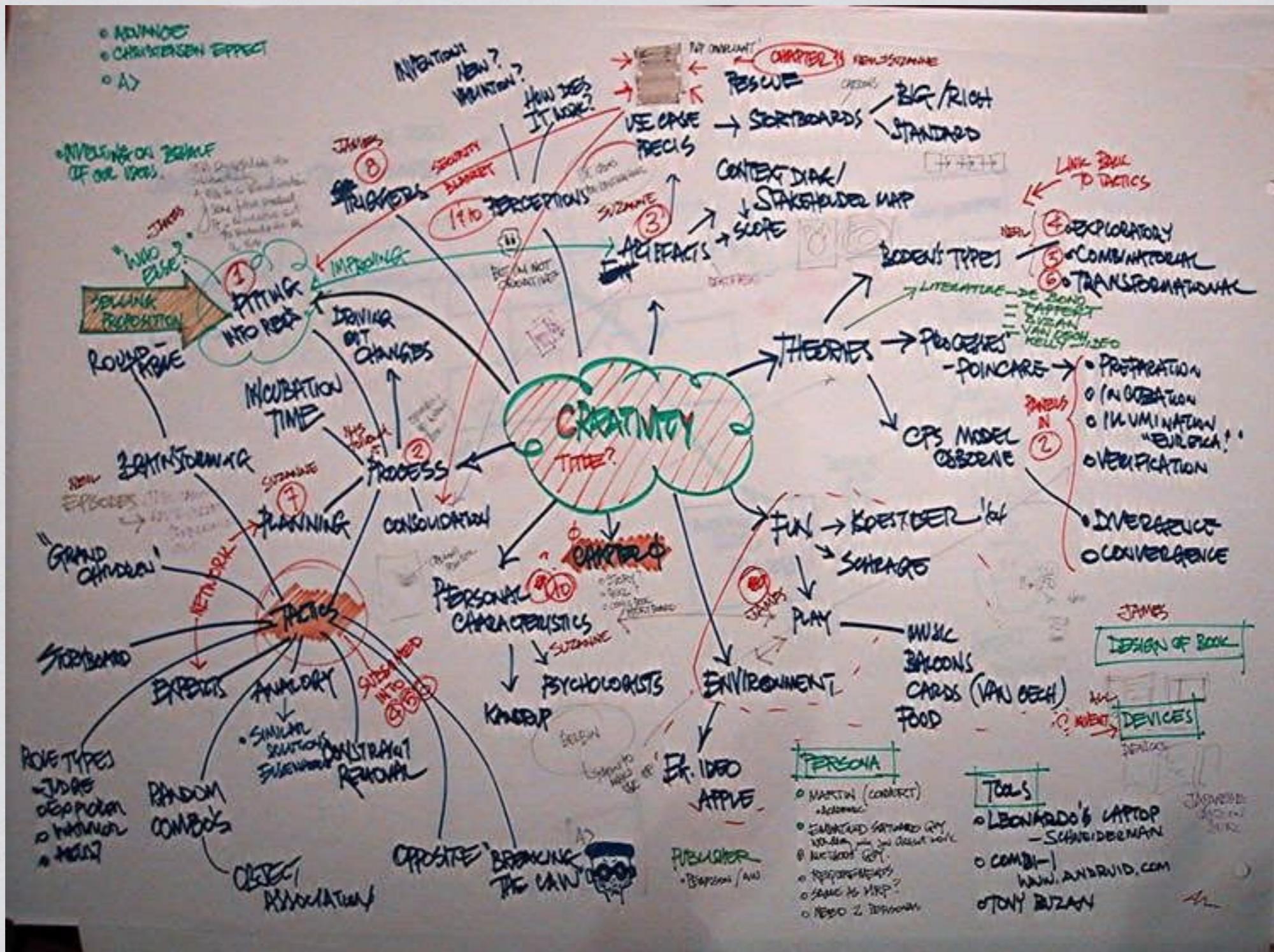
♦ Low Fidelity Prototypes (Sketches)

- Helps the stakeholder focus on the subject matter
- Pencils, whiteboards, flip charts, Post-it notes, index cards

♦ High-Fidelity Prototypes

- Built using software tools and have the appearance of working product
- Effective for discovering usability requirements

Mind Maps



The Murder Book

- ◆ Collect every document and other piece of “evidence” into a binder, sometimes several binders.
- ◆ Intention is to create a trail of items that can be referred to later from a central
- ◆ The technique is simple: Add every document, interview note, model, mind map, user story, and paper prototype—in fact, everything—to the murder book
- ◆ Add your artifacts in chronological order

Videos & Photographs

- ◆ A video or photograph is a way of capturing some moments in time so that you can study them later.
- ◆ It is a particularly useful technique if you want to show the current work to people who cannot visit the stakeholders' workplace.
- ◆ Take photos of whiteboards—to show the progression of ideas—and refer back to these images and include some of them in documents.
- ◆ Video and photographs are especially useful tools for distributed teams.

Wikis, Blogs, Discussion Forums

- ◆ This technique can apply to many types of projects.
- ◆ However, because it requires participation from a number of stakeholders, it is most effective for larger projects.
- ◆ You can use the web to find out about similar projects.

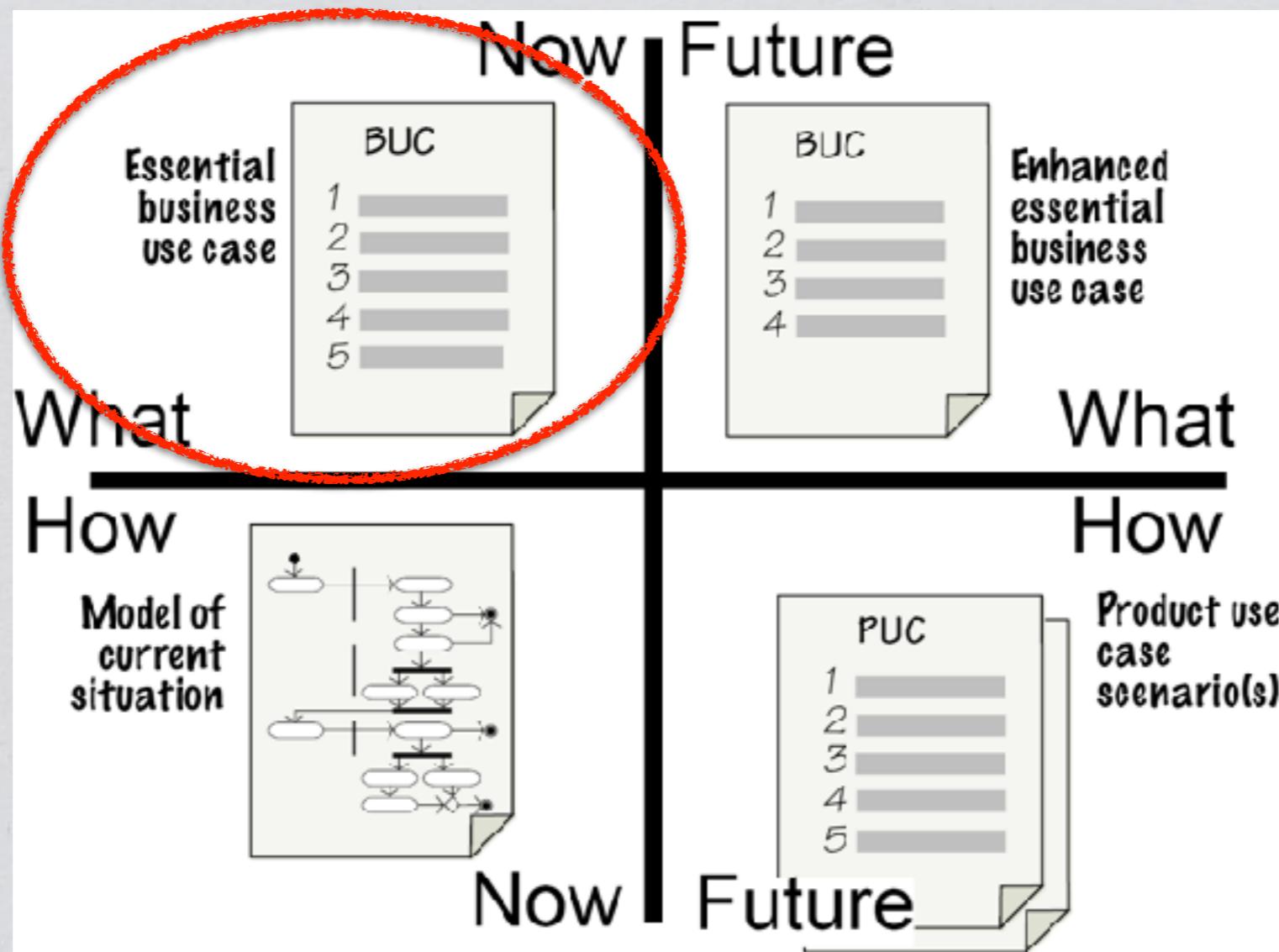
Table 5.1

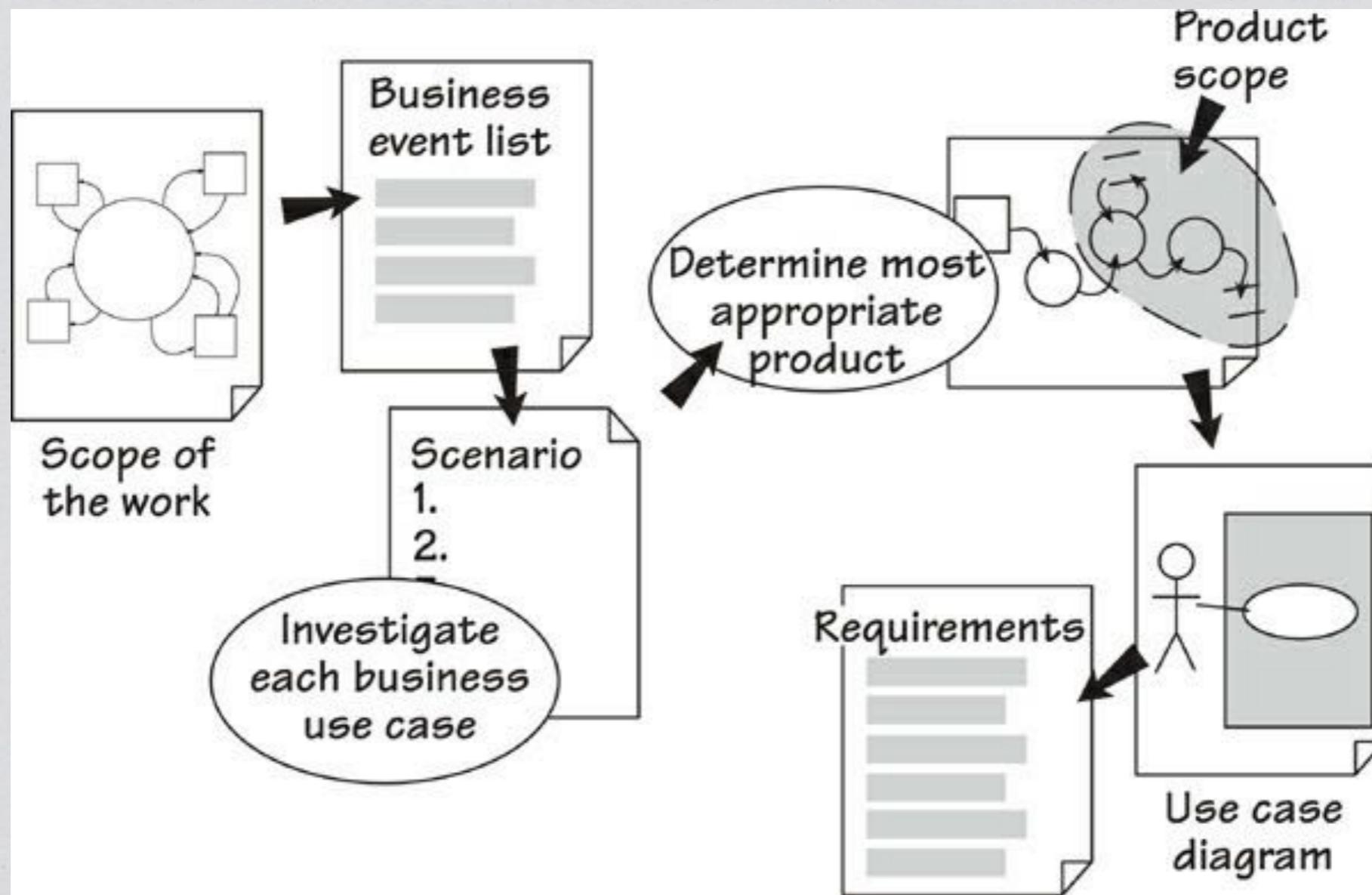
Trawling Techniques and Their Strengths	Trawling Technique	Strengths
	Business events	Partition the work for external demands
	Current situation modeling	Examines the legacy system for reusable requirements
	Apprenticing	Spends time working with an expert
	Structures and patterns	Identify reusable requirements
	Interviewing	Can focus on detailed issues
	Essence	Finds the real problem
1736711 2013/10/02 209.42.112.236	Business use case workshops	Focus the relevant stakeholders on the best response to the business event
	Creativity workshops	Team discovers innovative requirements
	Brainstorming	Facilitates creativity and invention
	Personas	Use a composite virtual character to represent the user/customer
	Mind mapping	An effective planning/note-taking technique
	Wikis	Online forums through which stakeholders can contribute
	Scenarios	Show the functionality of a use case
	Low-fidelity prototypes	Discover undreamed-of requirements
	High-fidelity prototypes	Discover usability requirements
	Document archeology	Uses evidence from existing documents and files
	Family therapy	Uses techniques from psychology to help stakeholders to understand a variety of viewpoints and to make choices clear.

SCENARIOS



How Now to What Now

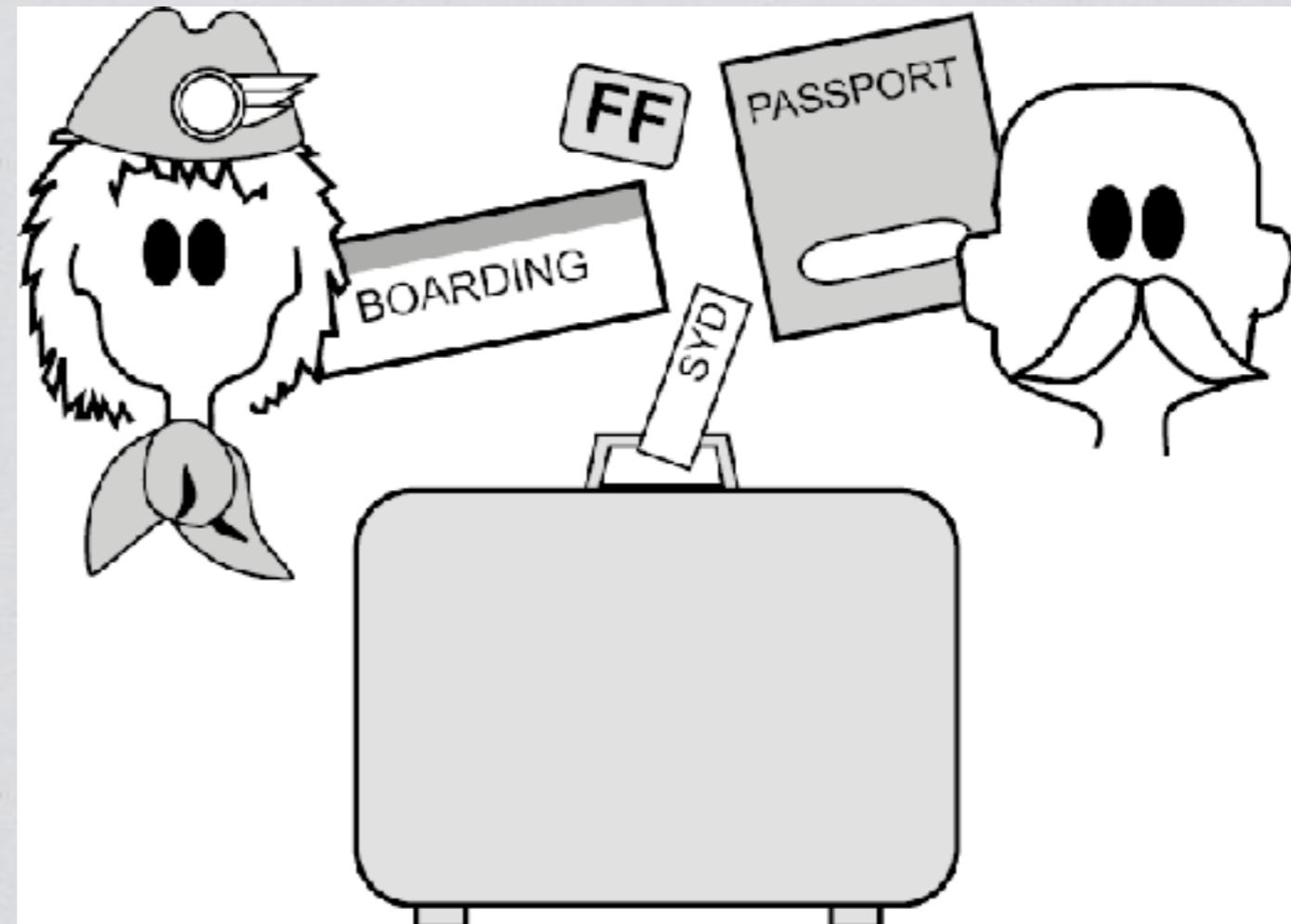




A scenario tells the story of the business use case

1. The moviegoer asks for movies based on her previously recorded preferences.
2. The moviegoer filters the movies based on the time of screening and the location of the cinema.
3. If requested, reviews of the shortlisted movies are provided.
4. The moviegoer selects a movie.
5. The moviegoer elects to buy the ticket online.
6. Ticket details and a quick response code are sent to the moviegoer's mobile phone.
7. The moviegoer elects to send e-mails to selected friends with details of the movie and an invitation to join her at the movies.
8. The moviegoer checks parking availability, and public transport options, for the cinema.
9. The moviegoer sets an alarm to remind her when it is time to leave for the movies.

An airline check-in for an international flight. As we go through the scenario for this case, see if it matches your experience of checking in for a flight.



Airline Check-In



“I call the next customer in line. When he gets to my desk, I ask for a ticket. If the passenger is using an e-ticket, I need the booking record locator. Most of the passengers are not organized enough to have it written down, so I ask them their name and the flight they are on. Most people don’t know the flight number, so I usually ask for their destination. They must know that!

“I make sure I have the right passenger and the right flight. It would be pretty embarrassing to give away someone else’s seat or to send a passenger to the wrong destination. Anyway, somehow I locate the passenger’s flight record in the computer. If he has not already given it to me, I ask for the passenger’s passport. I check that the picture looks like the passenger and that the passport is still valid.

“If there is no frequent-flyer [FF] number showing against the booking, I ask the passenger if he belongs to our mileage scheme. Either he hands me the plastic card with the FF number, or I ask him and if he wishes to join I give him the sign-up form. We can put temporary FF numbers against the flight record so the passenger is credited for that trip.

“If the computer has not already assigned a seat, I find one. This usually means I ask if the passenger prefers a window or an aisle seat, or, if the plane is already almost full, I tell him what I have available. Of course, if the computer has assigned a seat, I always ask if it is okay. One way or another we settle on a seat and I confirm it with the computer system. I can print the boarding pass at this stage, but I usually do the bags first.

“I ask how many bags the passenger is checking and, at the same time, verify that he is not exceeding the carry-on limit. Some people are unbelievable with what they want to carry into a fairly space-restricted aircraft cabin. I ask the security questions about the bags and get the passenger’s responses. I print out the bag tags and securely attach them to the bags, and then I send the bags on their way down the conveyor belt.

“Next I print the boarding pass. This means that I have everything done as far as the computer is concerned. But there is one more thing to do: I have to make sure that everything agrees with the passenger’s understanding. I read out from the boarding pass where he is going, what time the flight is, and what time it will board, and if a gate has been assigned, I tell him that, too. I also read out how many bags have been checked and confirm that their destination matches the passenger’s destination. I hand over the documents, and wish the passenger a good flight.”

Draft One

- ◆ Sketch out the scenario.
- ◆ Break the story down to the steps that you consider to be the best ones to capture the normal path through the story.

1. Get the passenger's ticket or record locator.
2. Check that this is the right passenger, flight, and destination.
3. Check that the passport is valid and belongs to the passenger.
4. Record the frequent-flyer number.
5. Find a seat.
6. Ask security questions.
7. Check the baggage onto the flight.
8. Print and hand over the boarding pass and bag tags.
9. "Have a nice flight."

Formalized Scenario

◆Part I: identity and name

Business Use Case Name: Check passenger onto flight.

◆Part II: Start up mechanism or trigger. Data and request coming from outside the work, or time-triggered event.

Trigger: Passenger's ticket, record locator, or identity and flight.

◆Part III : Pre-conditions. They indicate the state of the work at initiation. Usually this means certain other business events must have occurred before this business use case makes any sense.

Preconditions: The passenger must have a reservation.

Formalized Scenario

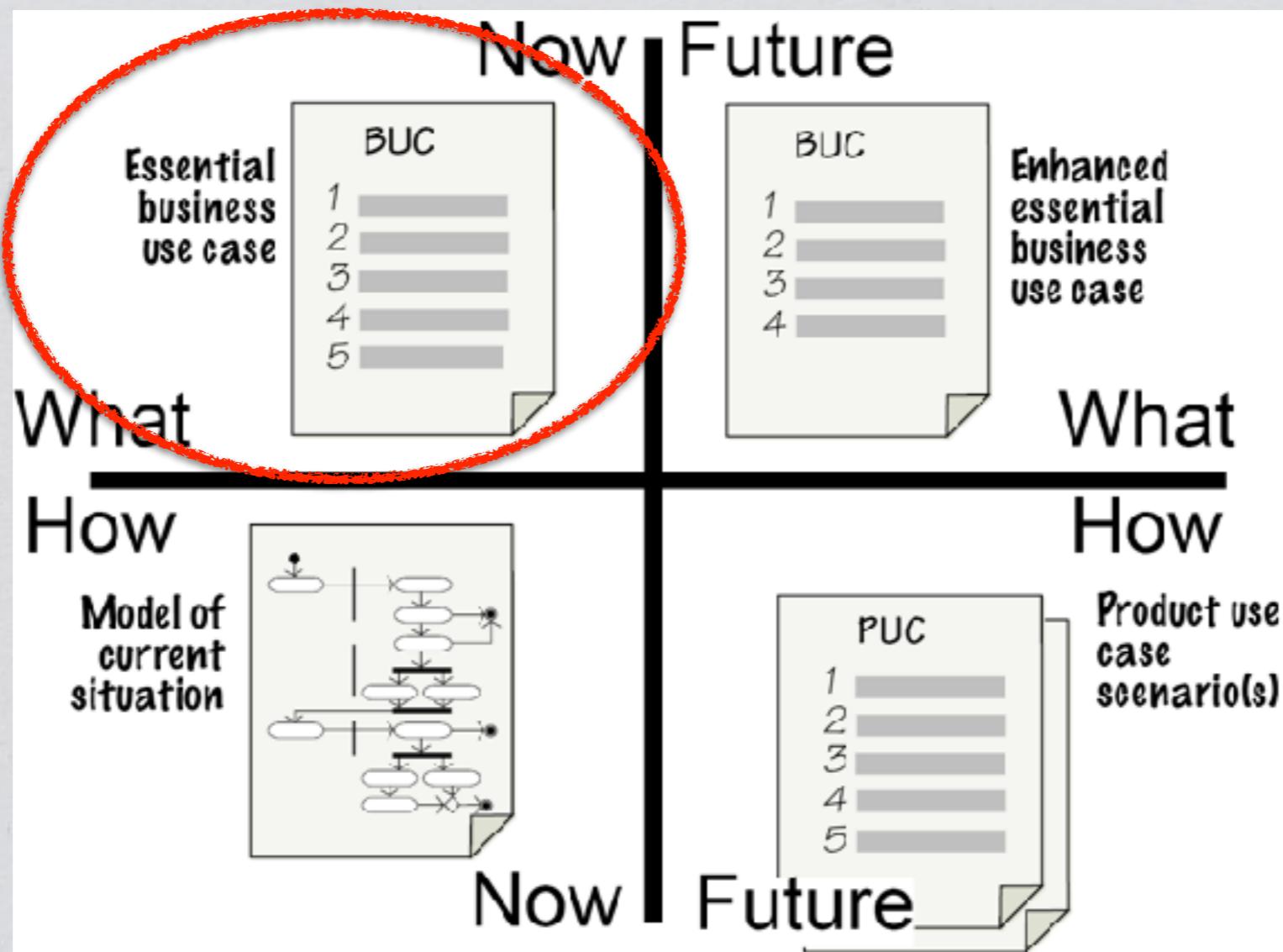
- ◆ Part IV (optional): Interested Stakeholders. These people have an interest in the outcome of the business use case.

Interested Stakeholders: Check-in agent, marketing, baggage handling, reservations, flight manifest system, workflow, security, destination country's immigration.

- ◆ Part V: Active Stakeholders. Active stakeholders are the people or systems that do the work of the business use case.

Active Stakeholders: Passenger (trigger), check-in agent.

How Now to What Now



How-Now, What-Now

Before

- 1. Get the passenger's ticket, record locator, or identity and flight number.*

After

- 1. Locate the passenger's reservation.*

Before

- 2. Check that this is the right passenger, flight, and destination.*

After

- 2. Ensure the passenger is correctly identified and connected to the right reservation.*

Before

3. Check that the passport is valid and belongs to the passenger.

After

3. Check that the passport is valid and belongs to the passenger.

3.1 The passport must be current.

3.2 The passport must not expire before the end of the complete trip.

3.3 The passport must be valid for travel to the destination country.

3.4 Visas (where needed) must be current.

3.5 There must be no "refused entry" stamps from the destination country.

Or

3. Check that the passport is valid and belongs to the passenger.

See procedure guidelines EU-175.

Business Event: Passenger decides to check in.

Business Use Case Name: Check passenger onto flight.

Trigger: Passenger's ticket, record locator, or identity and flight.

Preconditions: The passenger must have a reservation and a passport.

Interested Stakeholders: Check-in agent, marketing, baggage handling, reservations, flight manifest system, workflow, security, destination country's immigration.

Active Stakeholders: Passenger (trigger), check-in agent.

1. Locate the passenger's reservation.
2. Ensure the passenger is correctly identified and connected to the right reservation.
3. Check that the passport is valid and belongs to the passenger.

See procedure guidelines EU-175.

4. Attach the passenger's frequent-flyer number to the reservation.
5. Allocate a seat.
6. Get the correct responses to the security questions.
7. Check the baggage onto the flight.
8. Print and convey to the passenger the boarding pass and bag tags.
9. Wish the passenger a pleasant flight.

Outcome: The passenger is recorded as checked onto the flight, the bags are assigned to the flight, a seat is allocated, and the passenger is in possession of a boarding pass and bag claim stubs.

Business Event: Passenger decides to check in.

Business Use Case Name: Check passenger onto flight.

Trigger: Passenger's ticket, record locator, or identity and flight.

Preconditions: The passenger must have a reservation and a passport.

Interested Stakeholders: Check-in agent, marketing, baggage handling, reservations, flight manifest system, workflow, security, destination country's immigration.

Active Stakeholders: Passenger (trigger), check-in agent.

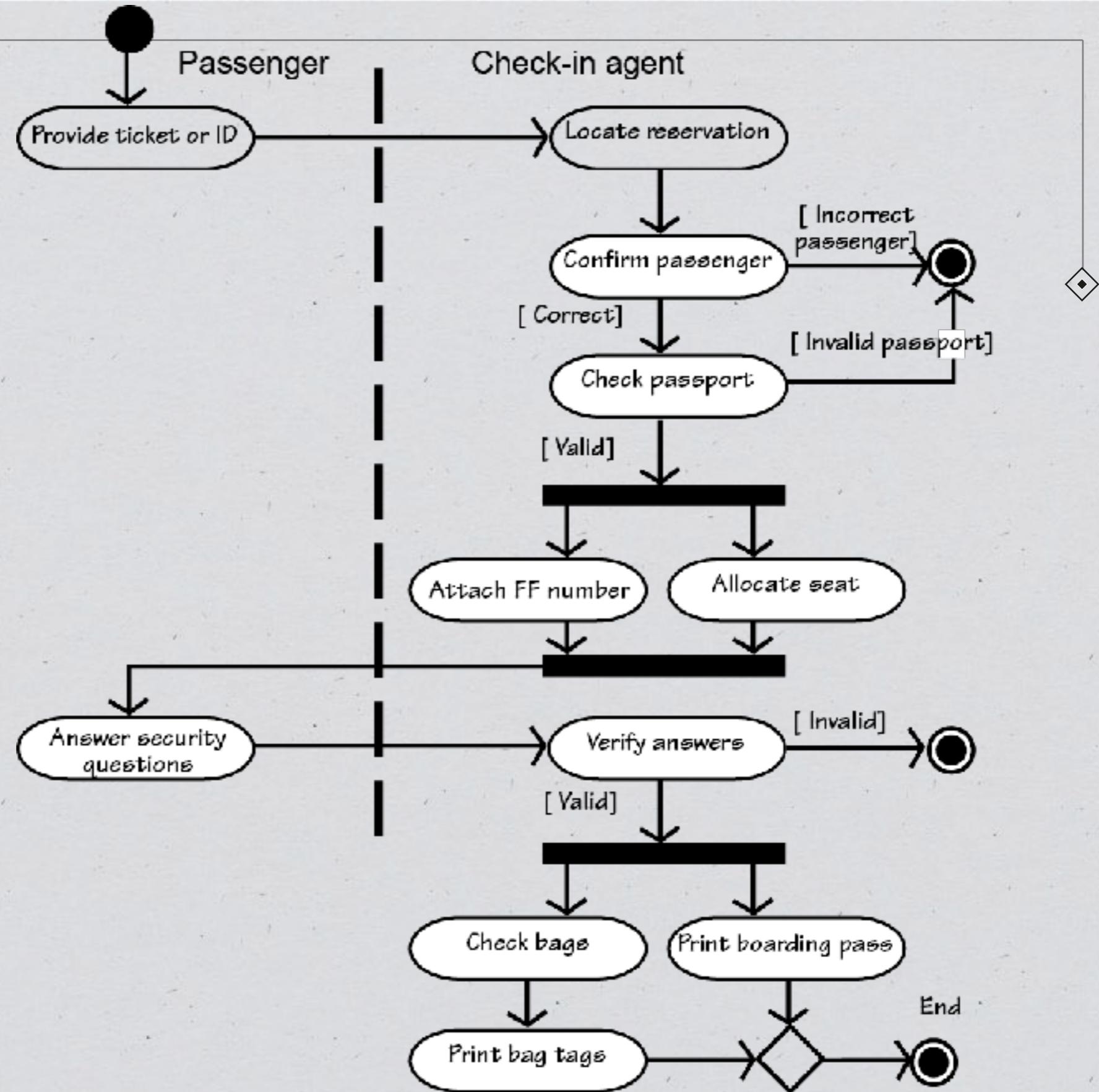
1. Locate the passenger's reservation.
2. Ensure the passenger is correctly identified and connected to the right reservation.
3. Check that the passport is valid and belongs to the passenger.

See procedure guidelines EU-175.

4. Attach the passenger's frequent-flyer number to the reservation.
5. Allocate a seat.
6. Get the correct responses to the security questions.
7. Check the baggage onto the flight.
8. Print and convey to the passenger the boarding pass and bag tags.
9. Wish the passenger a pleasant flight.

Outcome: The passenger is recorded as checked onto the flight, the bags are assigned to the flight, a seat is allocated, and the passenger is in possession of a boarding pass and bag claim stubs.

An activity diagram showing the passenger checking in for a flight. This is the equivalent of the scenario shown previously.



The following two things can be done in any order or in parallel:

- 4. Attach the frequent-flyer number to the reservation.*
- 5. Allocate a seat.*

Alternatives

4. Attach the frequent-flyer number to the reservation.

A4.1 Allow the FF number to be changed to that of a partner airline.

4. Attach the frequent-flyer number to the reservation.

A4.1 Allow the FF number to be changed to that of a partner airline.

A4.2 Allow the FF number to be changed to that of a family member,

A4.3 Allow the mileage of the flight to be donated to a charity of the passenger's choice.

Exceptions

5. Find a seat.

E5.1 The passenger's choice of seat is not available.

E5.1 Record a request for a seat change by the gate agent.

- ◆ What happens if this step cannot be completed, or does not go to completion, or comes up with a wrong or unacceptable result?
- ◆ What can go wrong at this step?
- ◆ What could happen to prevent the work from reaching this step?
- ◆ Could any external entity disrupt or prevent this step, or this business use case?
- ◆ Could any technology used to implement this step fail or become unavailable?
- ◆ Could the end user fail to understand what is required of him, or misunderstand the information presented by the product?
- ◆ Could the end user take the wrong action—intentionally or unintentionally—or fail to respond?

What-if? Scenarios

What if we take away the constraint of check in desk?

1. *The passenger calls the airline while en route to the airport.*
2. *Ask the passenger if he wants to check in.*
3. *If yes, get the record locator from the passenger's phone (this was sent at the time of the reservation).*
4. *Check the passenger onto the flight, and text the seat allocation and passcode (the passenger's phone will be scanned at the gates to allow the passenger to move through the airport).*
5. *Text bag checks (these will activate the automated bag tag printers at curbside).*
6. *Wish the passenger a pleasant flight.*

Mis-use Cases & Negative Scenarios

Misuse cases (you might like to think of them as “unhappy cases”) show negative or harmful possibilities, such as someone abusing the work or attempting to defraud it.

3. Check the passport is valid and belongs to the passenger.

M3.1 The passenger produces a passport that is not his.

M3.2 Call security.

M3.3 Freeze the reservation.

Scenario Template

Business Event Name: The name of the business event to which the business use case responds.

Business Use Case Name and Number: Give each business use case a unique identifier and a name that communicates the functionality—for example, Record Library Loan, Register New Student Enrollment, Make Benefit Payment, Produce Sales Report. Ideally, the name should be an active verb plus a specific direct object.

Trigger: The data or request for a service that arrives from an external source and triggers a response from the work. The trigger may be the arrival of data from one of the adjacent systems—that is, from outside the work area that you are studying. Alternatively, the trigger may be the arrival of the temporal condition that causes the use case to become activated—for example, the end of the month.

Preconditions: Sometimes certain conditions must exist before the use case is valid. For example, a customer has to be registered before he can access his frequent-flyer statement. Note that another business use case usually takes care of the precondition. In the preceding example, the customer would have registered using the Register Passenger business use case.

Interested Stakeholders: The people, organizations, and/or representatives of computer systems that have knowledge necessary to specify this use case or that have an interest in this use case.

Active Stakeholders: The people, organizations, and/or computer systems that are doing the work of this use case. Don't think about users just yet; instead, think of the real people who are involved in the work of the business use case.

Normal Case Steps: The steps that this use case goes through to complete the desired course of its work. Write these steps as clear, natural-language statements that are understandable to business people related to the project. There are usually between three and ten steps.

Step 1 . . .

Step 2 . . .

Step 3 . . .

Note that a business use case can make use of the services or functionality of another business use case as part of its own processing. However, be careful not to start programming at this stage.

Alternatives: Alternatives are acceptable variations on the normal case of processing. For example, gold cardholders may be given an invitation to visit the lounge when they check in. Tell the story in the same way:

Alternative step 1 . . .

Alternative step 2 . . .

Alternative step 3 . . .

If the alternative action is simple, you can make it part of the normal case:

Step 4. Attach the frequent-flyer number to the reservation.

Alternative 4.1 Issue a lounge invitation if the passenger holds a gold card.

Exceptions: These cases are unwanted but inevitable variations. For example, a customer may have insufficient funds for a withdrawal at an ATM. In this case, the procedure has to offer a lower amount, or offer a loan, or do whatever the stakeholders decide is appropriate. Tag each exception to the appropriate step:

Exception 2.1 . . .

Exception 2.2 . . .

Exception 2.3 . . .

Outcome: The desired situation at the end of this use case. You might call this the “post condition.” Think of it as the stakeholder’s objective at the time when he triggers the use case. For example, the money has been dispensed and taken from the ATM, the customer’s account has been debited, and the card has been extracted from the ATM.