University of Pisa

MSc in Computer Engineering

Systems for Strategic Management and Support

LECTURE 12

http://www.iet.unipi.it/m.cimino/ssms/

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COURSE TOPICS

S253 I) DISCOVER BUSINESS PROCESSES

S254 II) ESTABLISH PROCESS SCOPE AND CONTENTS

S255 **III) PROCESS WORKFLOW MODELS**

S256 IV) *AS-IS* PROCESS ASSESSMENT

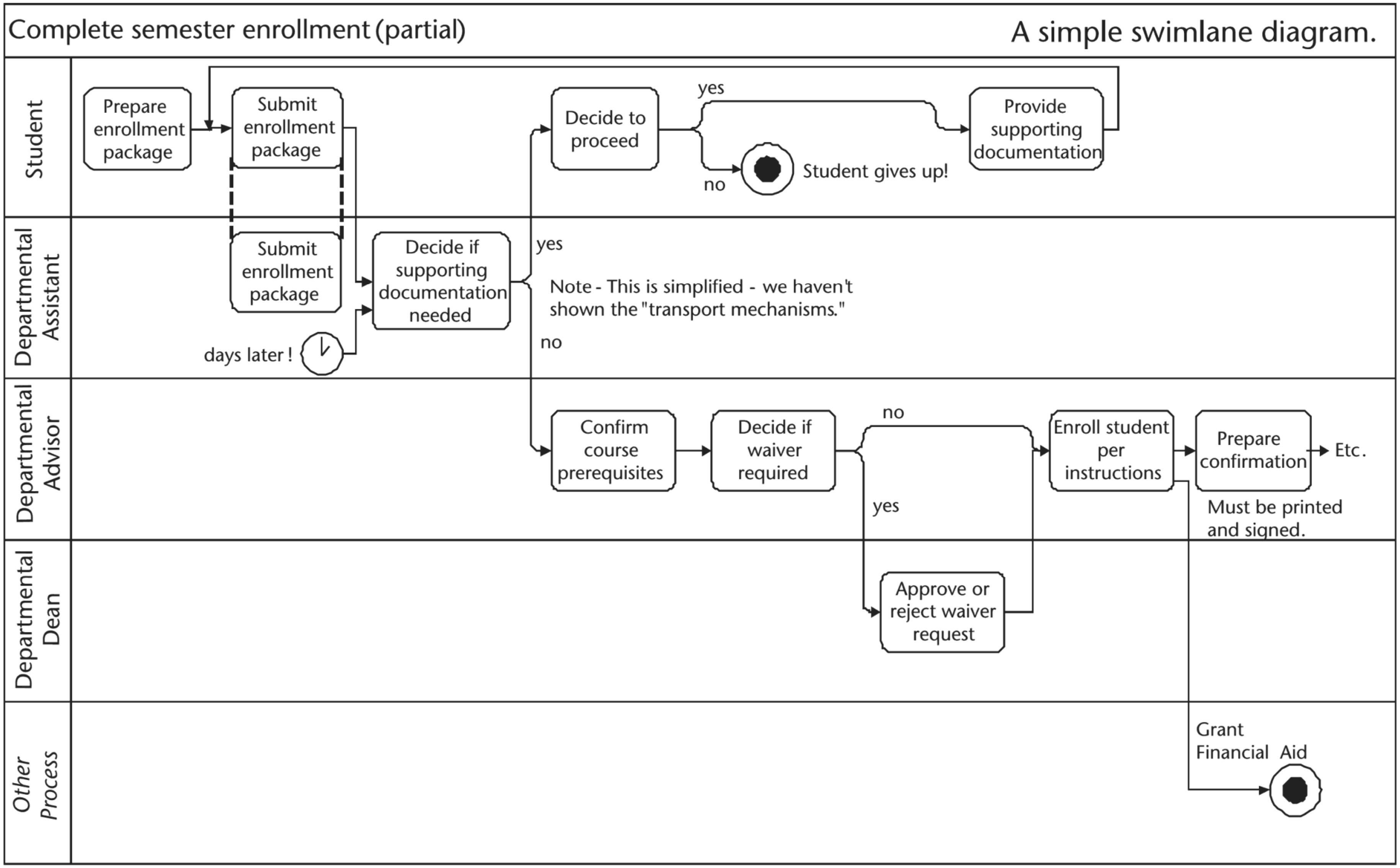
S257 V) *TO-BE* PROCESS ASSESSMENT

S258 VI) BUSINESS-ORIENTED DATA MODELING

S259 VI) REQUIREMENTS MODELING WITH USE CASE AND SERVICES

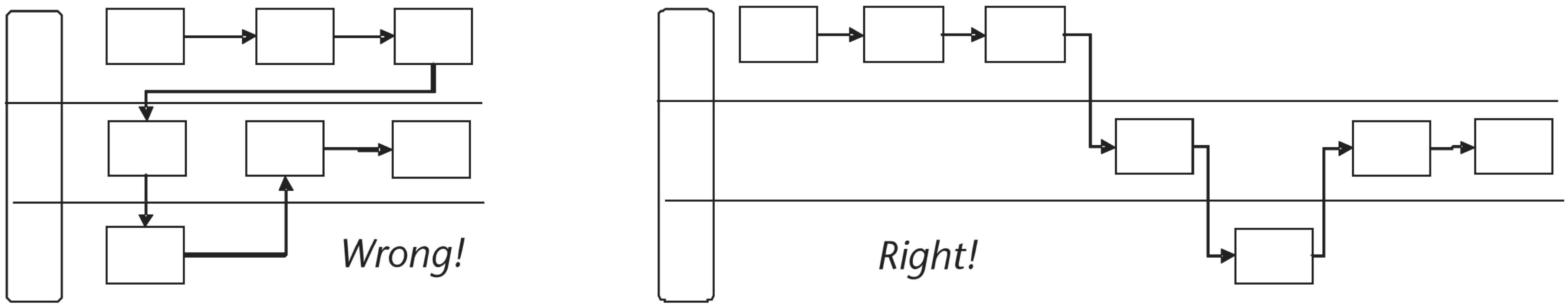
III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

- S260 The purpose of a workflow model is to show the flow of work
- S261 Show *every* actor that holds work while it flows through the process
- S262 Flow first, details (work) later
- S263 Names: process workflow model, workflow process model, **swimlane diagram**, process map, process responsibility diagram (PRD), responsibility process matrix (RPM), functional deployment chart, people-process chart, line of visibility (LOV) chart, activity diagram (UML), business process diagram in BPMN.
- S264 Models are not exactly made with BPMN, but we will understand why a BPMN business process diagram has some basic elements
- S265 Sequence (time) flow from left to right
- S266 Use the Simplest possible sequence of symbols
- S267 Show *every* actor that holds the work


Complete semester enrollment (partial)
A simple swimlane diagram.
Student
Departmental Assistant
Departmental Advisor
Departmental Dean
Other Process
Prepare enrollment package
Submit enrollment package
Decide to proceed
yes
no
Student gives up!
Provide supporting documentation
Submit enrollment package
Decide if supporting documentation needed
yes
no
Note - This is simplified - we haven't shown the "transport mechanisms."
days later !
Confirm course prerequisites
Decide if waiver required
no
yes
Enroll student per instructions
Prepare confirmation
Etc.
Must be printed and signed.
Approve or reject waiver request
Grant Financial Aid

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

S268



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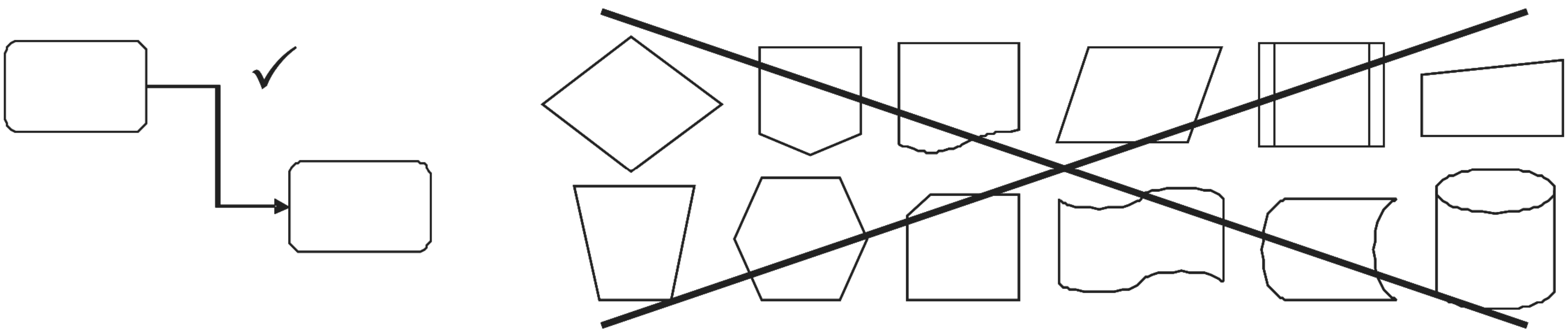

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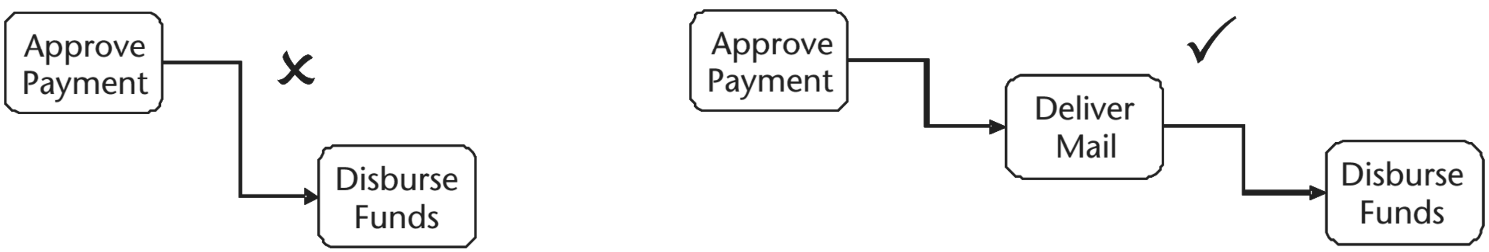
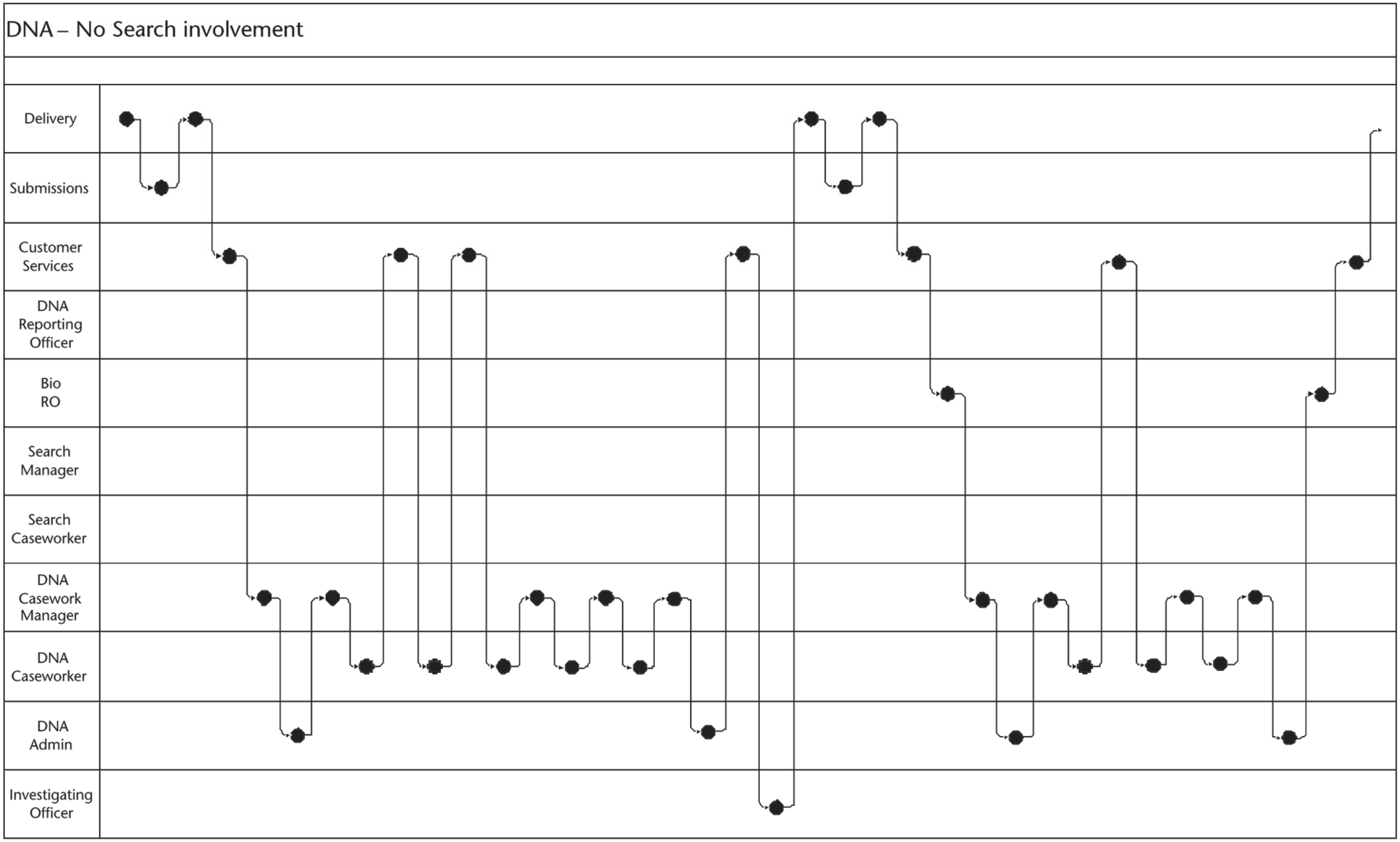


Left to right flow, simple symbols, all actors.

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

- First real example: *DNA for forensic sciences*. A minimalist workflow: dots indicate *work goes here* then move on

S271



(REMEMBER JUST THE LAYOUT, WITHOUT ACTORS' NAMES)

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

S272 • Get to the essence without diving into details.

S273 • First question to ask: who gets the work next?

Second real example: *issue building permit*

A mid-sized western municipality knew that it had serious problems in its "issue building permit" process. Issuing a residential building permit could take six months, and a commercial property, multifamily dwelling, or mixed-use project could take up to a year. Complaints were common, but the real problem was that new development had fallen off. This was a particular concern because the downtown business district had been in decline for some time and was shabby enough that even residents of the municipality were increasingly going to malls or business districts in surrounding communities. The municipality desperately wanted to attract the kind of mixed-use developments, with retail space on the ground floor and two or three residential floors above, which had been so successful in revitalizing other areas. The problem was that because it took so long to get a building permit, developers were not inclined to assemble property and arrange financing only to wait for a year for a permit. Among other initiatives to attract development, the municipality undertook to improve their Issue Building Permit process.

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

The first attempt didn't work out so well. They hired a nationally known consulting firm, reputedly with expertise in process redesign, that produced a stack of diagrams that were indecipherable to all concerned. At that point, we were called in to help out. Much of their budget had already been spent, so we had to dive into process modeling without time for the usual framing. Nonetheless, it went very well. We arranged a session and set about developing a workflow model using our standard three questions. Our intent wasn't to get at the details of everyone's work, but to establish the overall flow as a framework for subsequent analysis.

S274 • Question 1: "Who gets the work next?"

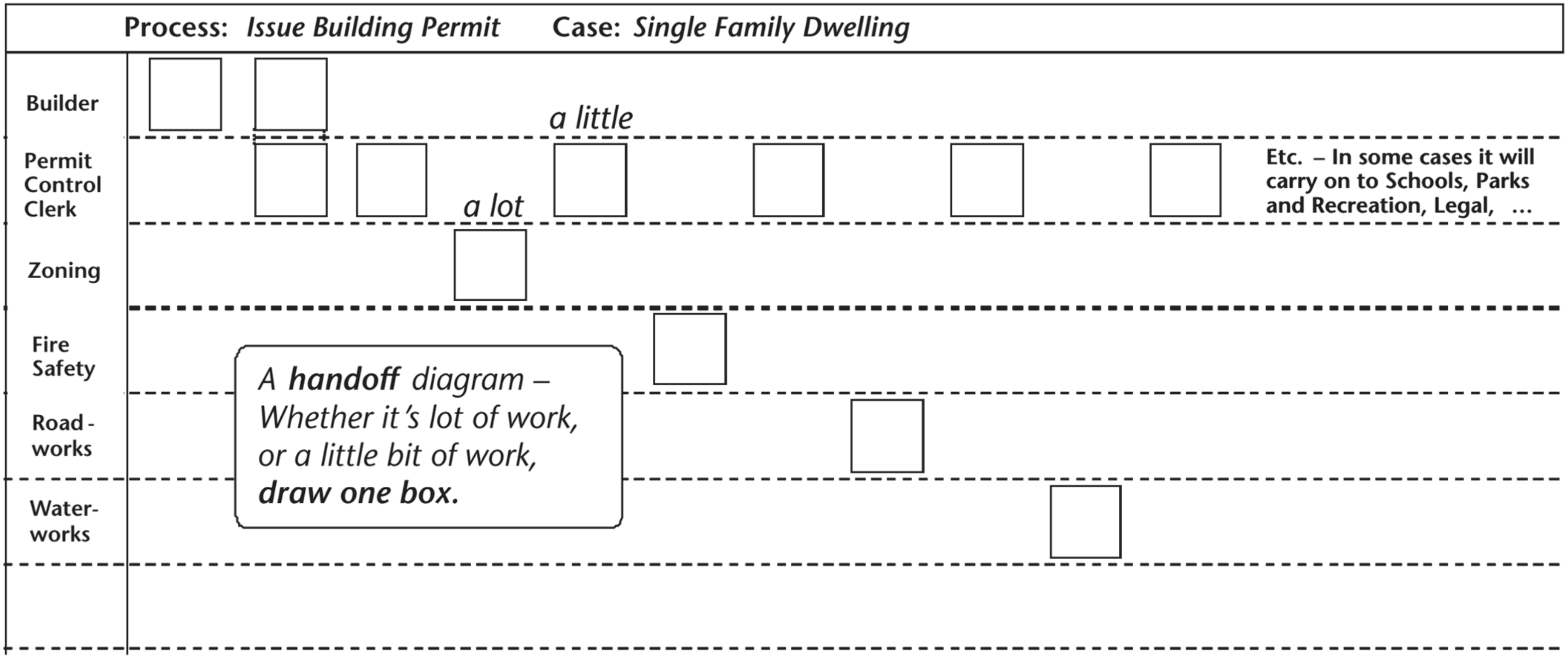
S275 • Force toward the result for the customer without stopping for any discussion of what participants do in the process

S276 • Do not consider decision points, always follow the main "sunny-day" case that leads towards the result for the customer

1. "What starts the process?" The builder prepares a permit application.
2. "Who gets it next?" There is a meeting of the builder and the permit control clerk (at city hall, during which the application is submitted and fees are collected).

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

S277



(REMEMBER JUST THE LAYOUT WITHOUT DETAILED NAMES)

The workflow model after question 1: "Who gets the work next?"

S278

- Some actors do a little bit of work, while others do a lot of work. Do not worry about, show a little box in either case.

3. "Who gets it next?" The permit control clerk (takes the application back to his or her desk and prepares the appropriate routing slip for the application, which in this case is for a single family dwelling, and sends it on to the first stop).
4. "Who gets it next?" The Zoning department (which does a lot of complex work involving checking fit within the official community plan, confirming setbacks, assessing site coverage and floor space area, and completing several arcane calculations such as average roof height, upper floor setback ratio, and even assessment of subterranean volume).
5. "Who gets it next?" The permit control clerk (who ticks off a box on the routing slip and forwards the application to the next stop).
6. "Who gets it next?" Fire Safety (who also do some fairly sophisticated calculations that balance sidewall glass area, roofing and siding materials, and the need for residential sprinklers).

S279 • Rule: Whenever an actor does a lot or a little of work, draw *one* box and *move down*

7. “Who gets it next?” The permit control clerk (who ticks off a box on the routing slip and forwards the application to the next stop).
8. “Who gets it next?” Engineering (who consider issues such as road access, curbing, and cutting into existing sidewalks).
9. “Who gets it next?” The permit control clerk (who ticks off a box on the routing slip and forwards the application to the next stop).
10. “Who gets it next?” Waterworks (who confirm the fixture count is within limits, and estimates fresh water consumption and waste water outflow, calculating estimated charges for each—hence the department’s unofficial motto “we get you coming and going”).
11. “Who gets it next?” The permit control clerk (who ticks off a box on the routing slip and might forward the application to other areas such as Parks and Recreation, or Education, but we’ve gone far enough to establish the basic pattern).

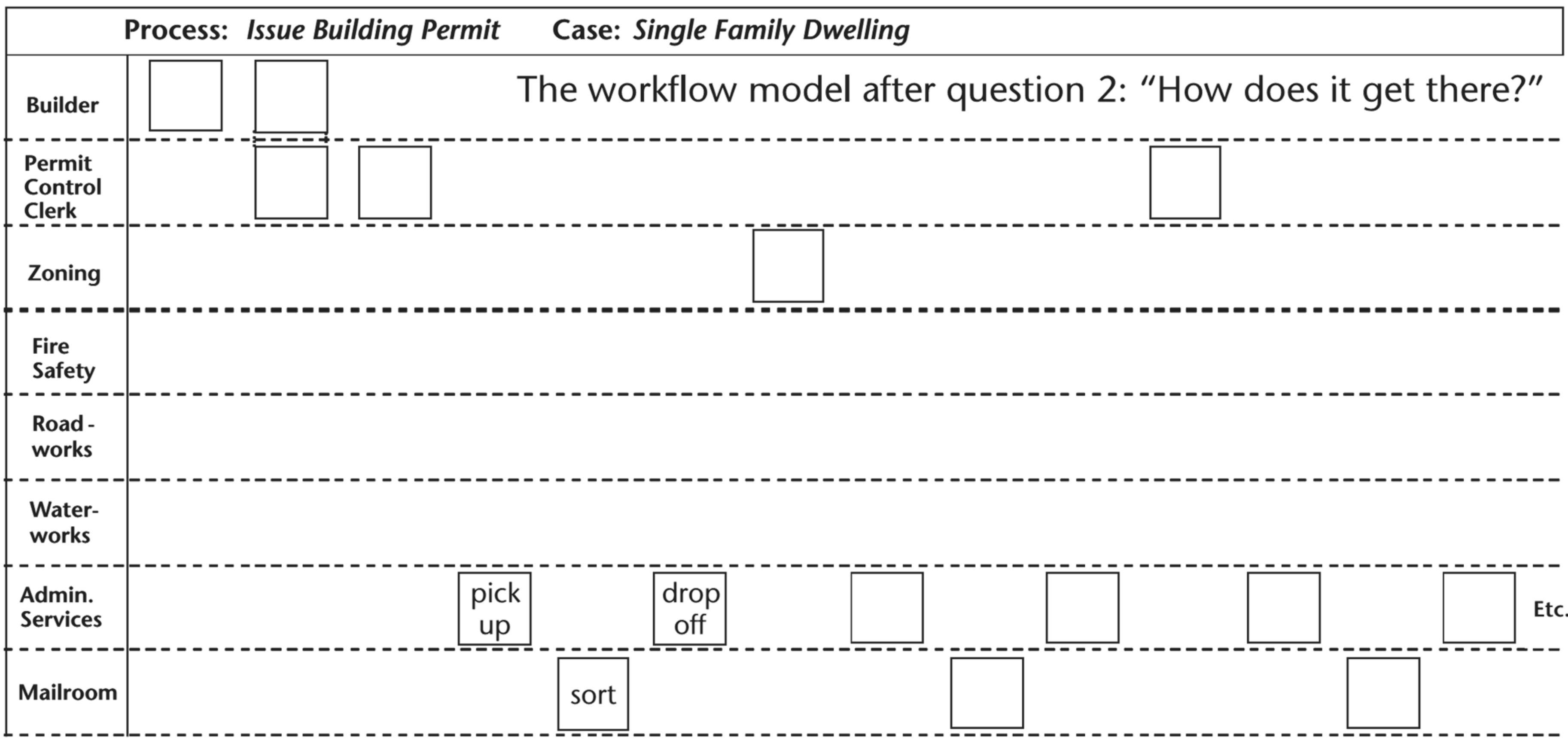
S280 • After using the first question, core participants have been identified, but you may uncover some other ones.

S281 • Question 2: “How does it get there?” Actors moving the work along.

1. There’s a flow from the builder to the meeting between the builder and the permit control clerk. “How does it get there?” The builder carries the application to the meeting, so no new actor is involved.
2. There’s a flow from the meeting between the builder and the permit control clerk to the permit control clerk. “How does it get there?” The permit control clerk carries the application back to their desk, so no new actor is involved.
3. There’s a flow from permit control clerk to zoning. “How does it get there?” Well, now things get interesting. It turns out that:
   a. The application is placed in the permit control clerk’s outbox and is picked up by Administrative Services. Even if their next stop is Zoning, they are prohibited by the collective agreement from delivering the application, because that would be “sorting,” which can only be done by the folks in the Mailroom. So…
   b. …the application is taken to the Mailroom, where it is logged and sorted into a delivery cart for…
   c. …Administrative Services, who deliver it to Zoning on their scheduled delivery run.

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

4. There's a flow from Zoning to the permit control clerk. "How does it get there?" Again, the work must go through Administrative Services, the Mailroom, and Administrative Services before it returns to the permit control clerk, who is going to put a tick on the routing slip and turn the application over to Administrative Services… You can see how this is unfolding.



S282

(REMEMBER JUST THE LAYOUT WITHOUT ACTORS' NAMES)

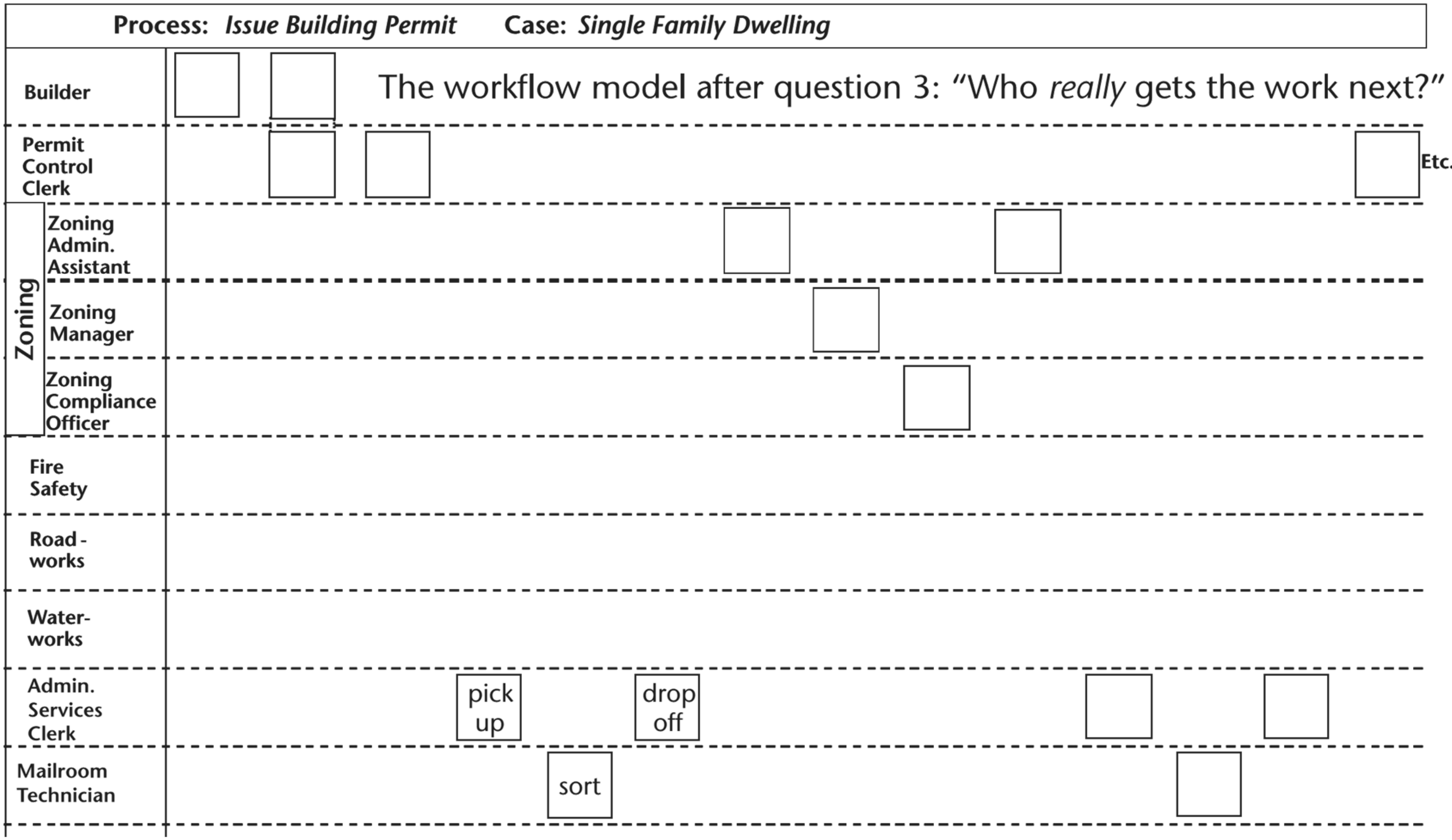
S283 • Question 3: "Who *really* gets the work next?" Someone or something else (systems, mechanisms) could be involved.

1. At the front end, the work involved the builder and the permit control clerk, so there were no changes to the diagram.
2. We refined the names of the next two actors to administrative services clerk and mailroom technician, but there were no new actors involved.
3. Now it got interesting. We found out that the actor who did the assessment was the zoning compliance officer, but the work didn't go directly there. It first went to the zoning administrative assistant, and then to the zoning manager before going on to the zoning compliance officer, who then completed their assessment. After that, it went directly to the zoning administrative assistant before being picked up by the administrative services clerk and carrying on through the process.

S284

- In the real example there are roughly 20 actors identified

(REMEMBER JUST THE LAYOUT, WITHOUT ACTORS NAMES)



- Other questions that have been made.

- Are there dependencies among the assessments? For instance, does Fire Safety care what Zoning said about the application? Answer: No, the assessments are totally independent.
- Could the assessments actually be carried out in parallel? Answer: Yes, in fact, they used to be done that way.
- Why, then, are the assessments carried out sequentially? Answer: Because there is only one copy of the plans accompanying the application, so only one department can use it at a time.
- Why aren't multiple copies of the plans submitted by the builder? Answer: Well, actually, we used to get multiple copies of the plans from the builder and send them to all departments at once.
- Okay, why did you stop having the builder submit multiple copies of the plans? Answer: Copying multiple sets of plans used to be quite expensive and could add up to many hundreds of dollars even for a single family dwelling, so when there was a recession several years ago, we waived the requirement for multiple copies as a way of giving the builders a break.

- Well, that explains a few things. Now, why does the application package go back to the permit control clerk after each assessment? Answer: For tracking purposes. When we first implemented the "single copy" process, we had the plans go directly from Zoning to Fire Safety to Engineering and so on. However, builders were forever phoning the permit control clerk and asking where their plans were, so as a service to the builders, we changed the process so the package went back to the permit control clerk after every assessment. That way, the permit control clerk can maintain a log and answer any questions about where the application package is.
- That leads to another question—if the permit application fails an assessment at any point, what happens? Is the builder notified? Answer: No. Back when there were multiple copies of the plans, we waited until all assessments were complete before notifying the builder, and they seemed to prefer it that way. We carried on with that practice after we went to the single copy process.
- So if an application fails an assessment, it just keeps going, without the builder being notified? Answer: Yes.
- And where does an application most commonly fail? Answer: At the first assessment, in Zoning. (And then it just keeps on going…)

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

- All right, just two more questions. First, if the admin services clerk picks up something that is addressed to one of the later stops on their route, why don't they just deliver it instead of taking it back to the Mailroom? Answer: Because that would constitute "sorting," and according to the collective agreement, only people in the Mailroom can do that.
- Second, does the zoning manager receive the application so they can assign it to the most appropriate compliance officer? Answer: No, the zoning manager simply "reviews" the application to stay "in the loop" with what's going on in the community. Each compliance officer is responsible for certain neighborhoods, so all applications for the same neighborhood will be assessed by the same compliance officer (which results in some compliance officers being very busy, while others have very little to do).

S285 • Lesson learned: a simple, minimalist, workflow model (showing the flow of work only) ensures more comprehensive assessment

S286 • Workflow excessively sequential, dependent on manual transit of work items, with much tracking and control steps in the main flow

S287 • "All models are wrong, but some are useful"

- Third real example: *RB Tel (Really Big Telephone Company).*
- *At RB Tel all sorts of people and departments are involved in customer contact activities. Analysts have determined the responsibilities of various departments, as described in the following paragraphs.*

Customer Service…

…is primarily responsible for assisting customers who are having difficulty with an RB Tel service. When a customer calls RB Tel's main customer inquiry number, they respond to prompts from an interactive voice response (IVR) unit, and service difficulties are routed to the next available customer service representative (service rep) (other matters—billing, service, disconnect, employment—are routed to the appropriate department). The service rep identifies the customer and enters this information on a call log record (CLR) form. After the customer describes the problem, the call can be handled in a number of ways. If the customer simply doesn't know how to use a particular feature, such as call forwarding, the service rep will assist the customer and record the details in the call log. (If the customer also asks about products or services, that is noted in the call log as well.) The CLR is then placed in the rep's "completed" tray. If the rep concludes that the problem is equipment related or requires a software change at the central office switch, the call is transferred to Repair Services, and the CLR is placed in the "pending resolution" tray. If the customer needs phone service connected, disconnected, or changed, the call is routed to a new service specialist, also within Customer Service; CLRs are also placed in the "pending resolution" tray. Note that when a new service specialist deals with a call that was transferred from a service rep, they complete a form describing how the call was resolved and so the service reps can close out their "pending resolution" CLRs.

The CLRs are picked up twice a day, and sent to Marketing Support, which is essentially a data entry department. They are entered into the service tracking system, and any that were "pending resolution" are printed and sent back to Customer Service, to await information from other departments that handled the call.

Repair Service…

…is staffed by inside repair technicians who handle trouble reports from customers who have either called directly or been transferred from another area such as customer service. In either case, the customer describes the problem, and the technician attempts to solve the problem using Xcheck, a sophisticated remote diagnostic system. Eighty percent of the time, they determine that the situation can be resolved by central office technicians working on the switching software, so the diagnosis information is sent to them. The other 20 percent of the time, Outside Repair Services are brought on the line, and an appointment is made for an outside repair technician to visit the customer's premises. In all cases when a call originated with Customer Service, any department that handled the call is expected to complete a form detailing their involvement and send it to Customer Service to record the resolution.

Service Analysis…

…takes the call logs from Customer Service and analyzes them, looking for opportunities to *up-sell* the customer. That is, they look for cases where the customer's inquiry indicates that they would benefit from subscribing to an additional service, such as a billing plan or call alert. Each prospect is written up on a *lead sheet*. If Service Analysis feels more information is needed about the customer, they contact Market Database Research. The additional information provided by Market Database Research is added to the lead sheet if they still feel that the customer warrants an up-selling call. Otherwise, the lead sheet is discarded.

Telemarketing…

…takes the lead sheets produced by Service Analysis and contacts the prospects, trying to sign them up for a new service. They also generate their own lead sheets, using research from a number of sources. If a prospect commits to buying new service, the call is transferred to a new service specialist to finalize the details.

III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

Market Database Research...

...handles a wide variety of queries from other departments that seek information about specific people or organizations (customers or prospects), the marketplace and industry in general, or on specific competitors. They will examine the company's records to obtain further information on a customer, as when a customer has been targeted for up-selling or when someone in the sales force needs additional information. They will often make use of external sources as well, such as government agencies, commercial information providers, or the Internet. A new line of business involves handling queries and research assignments from external customers.

- Advice:

S288 do not model workflow from a series of one-to-one interviews. You need to bring a group together to identify processes and to guide you through the main flow of each processes, after which you could interview to gather details about each actor contribution