

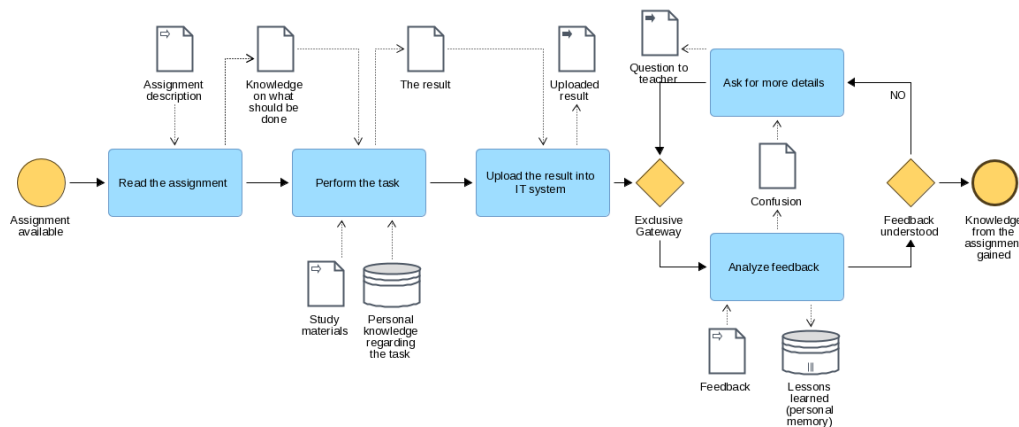
## ERASMUS+ EPIC Project

### Deriving IT requirements from business process models

There are several approaches how to derive requirements of IT solutions from business process models. Most commonly it is done using Use Case based approach. In these approaches particular activities or groups of activities are considered from the point of view of Use Cases, analyzing what IT system activities are needed to perform the task.

While Use Case approaches are easy to understand and handy for IT system developers, they have one drawback. Namely, the overall process view is lost when considering separate Use Cases. Therefore we will consider here a slightly different approach.

The approach will be discussed using a very simple business process (single process without showing collaboration) It is reflected in Fig. 1.



**Fig. 1.** Outlook of the model to start from (simplified)

### The method

To start the requirements derivation, the model first must be properly prepared. It can be single process without lanes, one pool with lanes or several pools with or without lanes, depending on modeling needs. What is essential for IT requirements derivation is that **inputs and outputs for each activity (task) are explicitly depicted**. So, before starting deriving the requirements, check each activity regarding its inputs and outputs.

We will consider here two types of requirements: **Data requirements** and **Functional requirements**. This method does not consider non-functional requirements, such as security.

For deriving non-functional requirements, special, sophisticated, business process model based approaches exist and can be picked up in different textbooks and research papers.

If all inputs and outputs for all activities are defined then proceed as follows:

1. Go through all events and activities sequentially
2. For each event and activity ask the questions as they are stated in Table 1. and Table 2. correspondingly and derive data and functional requirements on the basis of them.

**Table 1.** Questions to be asked about events

<b>Event type</b>	<b>Question</b>	<b>Requirements</b>
Start event	<ol style="list-style-type: none"> <li>1. What information is received to know that the event has happened?</li> <li>2. Is the IT solution involved in delivery/receiving of this information. If yes, what does it do?</li> </ol>	If IT solution is involved, information becomes a data requirements, and the identified activity of the IT system becomes a functional requirement
Intermediate catching event	<ol style="list-style-type: none"> <li>1. What information is received to know that the event has happened?</li> <li>2. Is the IT solution involved in delivery/receiving of this information. If yes, what does it do?</li> </ol>	If IT solution is involved, information becomes data requirements, and the identified activity of the IT system becomes a functional requirement
Intermediate throwing event	<ol style="list-style-type: none"> <li>1. What information is delivered to inform about the event?</li> <li>2. Is the IT solution involved in delivery/receiving of this information. If yes, what does it do?</li> </ol>	If IT solution is involved, information becomes data requirements, and the identified activity of the IT system becomes a functional requirement
End event	<ol style="list-style-type: none"> <li>1. What information is delivered to inform about the event?</li> <li>2. Is the IT solution involved in delivery/receiving of this information. If yes, what does it do?</li> </ol>	If IT solution is involved, information becomes data requirements, and the identified activities of the IT system become a functional requirements
Boundary events	Proceed as with intermediate events	Proceed as with intermediate events

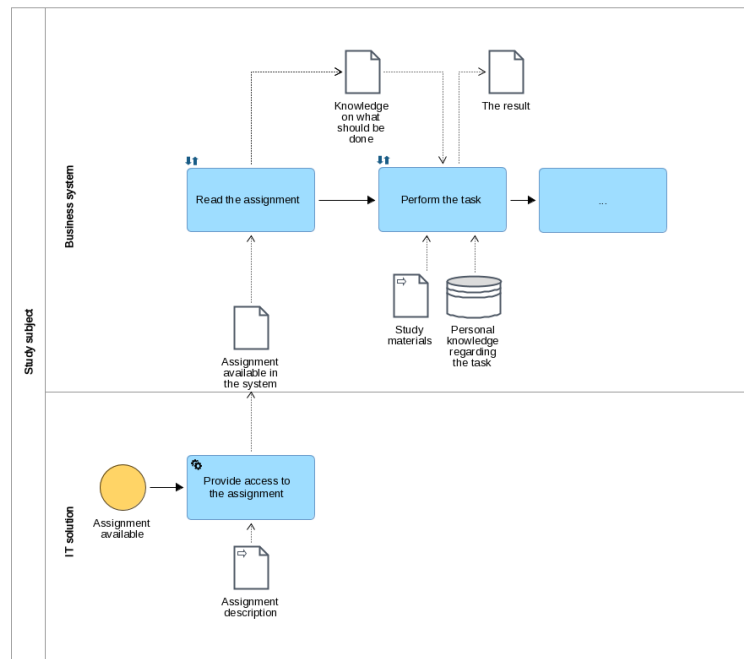
**Table 2.** Questions to be asked about activities

Event type	Question	Requirements
Un-specified activities	1. What type of activity is it: manual, computer based task, or a script (software task)	n/a
Script or service task	1. Are all inputs defined? 2. Are all outputs defined? 3. What the software should do to a) Receive inputs b) To transfer inputs into outputs c) To deliver outputs	Inputs and outputs become data requirements Software activities become functional requirements
Computer based task (User task)	1. What activities does computer do (you may decompose the task to see this)? 2. What information is exchanged between the human performer and the IT solution?	Exchanged information becomes data requirements Software activities become functional requirements
Manual task	1. Is IT solution involved in delivery/receiving of inputs or outputs? 2. If yes, what exactly the software should do?	If IT solution is involved, inputs and outputs become data requirements, and the identified activities of the IT system become functional requirements
Rule task	Proceed as with computer based task	Proceed as with computer based task.

3. (For collaboration processes only) Check the consistency of requirements defined for matching events or activities, related with message flows.
4. Establish a lane or a pool “IT solution”. In this pool accommodate all functional requirements you have derived as service or script tasks (you may find still some inconsistencies – so modify requirements if needed).
5. Position all data requirements in the IT solution pool (or lane) and relate them to corresponding activities (or events) within or outside the IT solution pool. Modify the model as necessary (e.g. decompose the activities, rearrange them or discard not needed ones). Now you see the solution as it should be (To-Be IT system) and how it relates to the business system.

*This step can be done at different levels of detail depending on the level of abstraction at which you want to define the requirements. Suppose, you are at the first cycle of requirements definition, and just want to know, in general, what the IT solution must do. In this case, the representation shown in Fig. 2 regarding the first*

activity depicted in Fig. 1, would be sufficient. And you would derive the data requirements “Assignment” (still important to make sure how this assignment becomes available to the system) and “Assignment available in the system”; and you would have a functional requirement <Input: Assignment; Function: Provide access to the assignment; Output: Assignment available in the system>.



**Fig. 2.** Positioning the IT solution

*In case you would be open to pay IT developers for further detailing the requirements, this would be sufficient to request the IT solution (let us suppose that currently there is no any specific solution available and students get assignments at face-to face meetings). However, if you are interested in more specific issues regarding the “Read assignment”, for instance, you want the system to inform the student that the assignment is published, or you wish to give a student a possibility to sign for reminders about the assignment or anything else; you shall show more details in the IT solution lane or pool, and correspondingly show all data objects transferred from and to the business system and within the IT system. You shall choose that level of detail which makes the difference for the business system, so that you really can see the benefit of introducing new or changing the existing IT solution. Less detailed are the requirements – more freedom you give to developers. This freedom can bring in innovative solutions which you could not imagine by yourself, but in no way you can expect that you will receive the things you think are for granted or intuitively the MUST things, if you have not specified them at the IT solution level. Thus – more detailed the requirements, less risks to do not get a useful*

*solution. Les detailed requirements – more attention has to paid to legal procedures in the contract with developers, because the risks to get useless solution are very high.*

6. Check, in IT pool or lane, which of depicted activities and data objects are already supported by the existing IT solution (if such exists).
7. Identify the gap between supported and not supported activities and data objects. This can be done by listing all data objects and activities in the IT system pool or lane and mark them as “exists or should be modified from existing solution, or should be developed.
8. From the “should be modified” and “should be developed” data objects and activities form the actual requirements for the development of the new solution.