smart·BA
distance learning programme

A Certificate in Modeling Process

A Self Study
Just Enough Essential Points ('JEEP')
Manual

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FIRST EDITION

A Certificate in Modeling Processes smart·BA
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Self Study 'JEEP' Manual

CONTENTS

A Certificate in Modeling Process smart·BA
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Self Study 'JEEP' Manual

Introduction:

Hello and welcome to the smart-BA distance learning programme manual to help you prepare for an exam in Modeling Processes such as the ISEB Certificate in Modeling Business Processes – there are many people who have used this manual to prepare for that exam and we have received excellent feedback on how useful it is. This is a JEEP manual: Just Enough Essential Points to help you pass an exam.

Who is the manual for?
- Business Analysts who know the subject area and don't need a classroom based course
- Business Analysts who already know the fundamentals of what business analysis is all about
- Business Analysts who have already captured requirements, modeled processes and perhaps even modeled data requirements on a change project involving computerised solutions
- Business Analysts who have familiarity with the principle concepts of computers

Who is the manual NOT for?
- those who have no experience of Business Analysis
- those who do not know what a requirement is or what a process model looks like
- those who have not already worked as a Business Analyst on change projects
- those with no familiarity of analysing requirements for computerised solutions

Key points:
- Most exams in Modeling Processes focus is on defining and managing processes
- This manual focuses solely on what you would need in order to pass exams in Modeling Processes
- The manual format is to present each section of the syllabus in order and each section will contain
    o Information you need to know about the section
    o Suggestions for further reading
    o Exam style revision question
    o Mock exam when you have completed the manual
- This is a self study manual – but if you need help contact MP@smart-BA.com
- **Please be aware that it is illegal to copy and/or otherwise distribute all or part of this copyrighted manual.**

Detail:
This manual is concerned with the any Certificate in Modeling Processes. It assumes that as this is a standard subject that any exam scheme with a certificate in this area will have to cover the same subjects. For example to ISEB Certificate Modeling Processes covers the approach to process definition and management. Its focus is on using a systematic approach to eliciting, analysing, validating, documenting and managing processes.

Although the manual focus is on covering the material you need to cover in order to pass an exam, a lot of what you will learn will be useful to you as a Business Analyst as well.

Because the manual is geared towards passing an exam the format has been designed to cover each section in the contents in turn. There is suggested further reading for each sections and for most but not all sections you can test your understanding with a question in the style of an actual exam – there is a model answer and you can also have your answer marked and commented on by an experienced Business Analyst.

Having completed the manual in this fashion, there is a mock exam for you to take on your own – again a model answer is presented and you can also have your answers marked by a. It goes without saying that you should approach the exam questions and mock exams with complete honesty: the objective is to find any weaknesses in your understanding BEFORE the exam so cheating at this stage will only degrade your chances of passing the exam.

This is a self study manual but should you need to discuss or clarify anything please do not hesitate to contact MP@smart-BA.com

A Certificate in Modeling Processes smart·BA
distance learning programme
Self Study 'JEEP' Manual

What can be expected of Process Modelers

Objectives

Holders of the a Certificate in Modeling Processes should be able to:

- Identify and model processes from a business organization perspective
- Decompose processes to an atomic level
- Analyse requirements within processes
- Analyse managerial and performance requirements of processes
- Re-engineer processes

Modeling Processes Syllabus Sections

Syllabus

1. Why model processes?
2. What is a process? How to identify them.
3. Modeling processes
4. Re-engineering processes
5. Relationships between business processes requirements to system requirement specification

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Syllabus Section 1: Why Model Processes?

Key Points
Relationship between business systems and automated systems
- A business system is a defined process delivering specific goods or services to customers.
- An automated system is a business system with some or all processes automated fully or partially.

Purpose of modeling processes
In order to implement the best automated system the business system will need to be modeled in order to define
- what the starting point of the change is
- how business systems will work post change
- what can and what can't be automated
- the non-functionals for each process

Approaches to process modeling
- there are various methods. This manual uses Process Modeling Notation (BPMN) See Section 3 Modeling Processes for details on BPMN symbols and usage.
- all employ a top-down approach
- partitioning a process model allows analysis in parallel by Business Analysts on different parts of the same overall process

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Self Study 'JEEP' Manual

Detail:

Relationship between business systems and automated systems
- **A business system is a defined *process* delivering *specific goods or services* to customers.**
  - o A *process* is a connected series of business activities (at the lowest level these are tasks) designed to produce a meaningful outcome for the business. It caters for all transactions in scope (i.e. it is not at the transaction level like the procedure is). Example process: "place order" caters for the transactions "place order for product A", "place order for product B" and so on. Process should always be named as verb and noun – something is being done (verb or verb phrase) to something (noun or noun phrase).
  - o The *specific goods or service* in this case is the ability to order.
  - o The customer may or may not be a fee paying customer: the person placing the order might be the same person who has to pay for the goods (self-serving via the internet for example), equally they might be a sales assistant in a shop placing the order on behalf of the customer in front of them, or a call handler in a call centre placing the order on behalf of the caller.
- **An automated system is a business system with some or all processes automated fully or partially.**
  - o Processes can be broken down in to sub-processes and so on. The lowest level process is called a task. Automation is declared at the task level.
  - o A task can be fully or partially automated.
  - o If all tasks in a process are fully automated the process is fully automated. The most usual scenario is partial automation of tasks that will require user interaction. Example: the task "find customer" will search the data held about customers for the information supplied by the user.

Purpose of modeling processes
In order to implement the best automated system the business system will need to be modeled in order to
- **define what the starting point of the change is**
  - o a project executes a series of activities to move the business from how it currently operates to how it wants to operate. It follows that how it currently operates is the starting point and that this needs to be defined. The starting point can be defined from many perspectives, one significant perspective being how the processes currently work.
- **define how business systems will work post change**
  - o a project executes a series of activities to move the business from how it currently operates to how it wants to operate. It follows that how it wants to operate is the finishing point and that this needs to be defined. The finishing point can be defined from many perspectives, one significant perspective being how the processes should work.
- **identify what can and what and can't be automated**
  - o the user / solution interface defines what will and will not be automated. The execution logic specified for each task will define what the user supplies to the system and what the system supplies to the user. What the user supplies is not automated, the production and supply of what the system produces is automated. Not everything can (or should) be automated.
- **define the non-functionals for each process and task**
  - o At the appropriate level (i.e. the level at which the non-functional requirements are true for any sub-processes and/or tasks contained within a process or task) the following non-functional requirements should be defined for each element:
    - ▪ Who can use it (names, job roles, system roles, etc). Example: Sales Order Clerk
    - ▪ How many users can use it concurrently. Example: up to 100 concurrent users.
    - ▪ Where (physically) it can be run. Example: The Call Centre at No 1 The High Street, Anytown.
    - ▪ When it is available for use. Example: 08:00 to 18:00 Monday to Saturday excluding Bank Holidays.
    - ▪ How often it is run. Example: up to 1,500 transactions per hour.
    - ▪ How quickly it should execute. Example: it should take no longer than 5 seconds to find a customer.
    - ▪ How reliable it should be. Example: no more than 2 un-planned system unavailable events per year.
    - ▪ Any usability requirements. Example: allow the order in which data items are supplied to be customised.

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▪ Anything else which is not a functional requirement.

Approaches to process modeling
- there are various methods. This manual uses BPMN. See Section 3 Modeling Processes for details on BPMN symbols and usage.
  - o Data Flow Diagrams – no longer recognised by ISEB as a process modeling technique.
  - o Flow charts – used widely but have severe limitations:
    - ▪ Tend to be drawn at a transactional level
    - ▪ Assumes one start point
    - ▪ Does not handle process breaks very well
    - ▪ Assumes one end point
  - o Flow charts are not recommended for modeling processes
  - o Process Dynamics diagrams – one of a set of event based process modeling techniques
  - o Process Modeling Notation – the standard way of modeling processes. Event based. The rest of this manual will use BPMN. See Section 3 Modeling Processes for details on BPMN symbols and usage.

- **all can employ a top-down approach**
  - o This is known as progressive decomposition of processes to the lowest level where processes are known as tasks
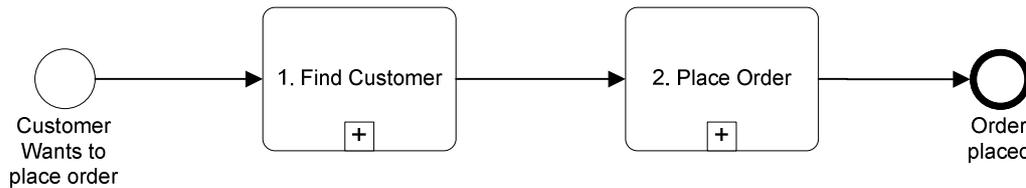
  - o The following shows how the first process decomposes:
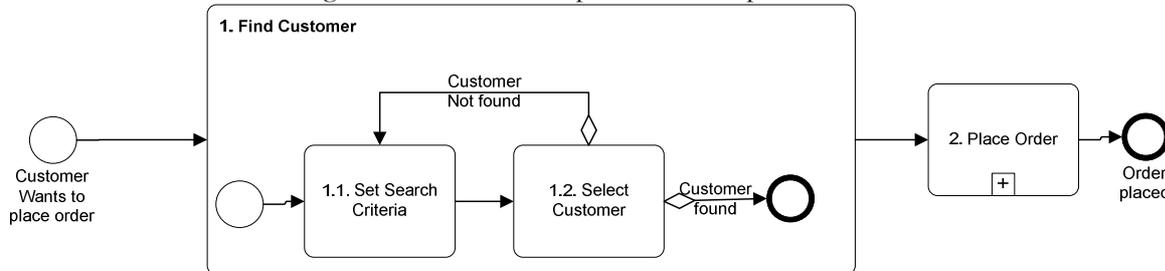
  - o Notes
    - ▪ a rectangle with centralised name and a "+" in means collapsed process
    - ▪ a rectangle with no "+" in, the name in the top left and a process shown inside it is an expanded process
    - ▪ a rectangle with centralised name and no "+" in means a process that does not decompose: i.e. a task
    - ▪ we will cover modeling notation in more depth in section 3: Modeling Processes
    - ▪ note how the decomposition raises the question "what if the customer can't *be* found?" Maybe the customer is new. Maybe there is another reason. However, what *rules* does the process model specify? It states that the loop of set search criteria => select customer cannot be left until the customer is found. This may or may not be correct, but note that the model defines must happen, and that the higher level process model did not really prompt the question.

- **partitioning a process model allows analysis in parallel by Business Analysts on different parts of the same overall process**
  - o If a process model is defined well with processes and tasks that do not overlap, then
    - ▪ Business Analysts can be given the job of developing all the detailed requirements associated with the processes and tasks knowing that they will not be working in areas that other Business Analysts are also working in
    - ▪ There will be no gaps in the requirements
  - o Partitioning processes and tasks will covered in more detail in Section 2: Identifying Processes.

Further Reading for Syllabus Section 1

Business Analysis – Debra Paul and Donald Yeates
Business Analysis – Debra Paul and Donald Yeates
Published by: The British Computer Society
ISBN 1-902505-70-0

Chapters 7-8

A Pragmatic Guide to Process Modeling by Jon Holt
Published by: The British Computer Society
ISBN: 978-1-912505-66-4
Relevant Chapters/sections:

Chapters 2 & 3

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A Certificate in Modeling Process smart·BA
distance learning programme
Self Study 'JEEP' Manual

Extracts from the IIBA UK Chapter – BA Recommended Reading List

The Basics of Process Mapping
Robert Damelio, Productivity Inc, 1996
A slim pocket book introducing at a very elementary level notation for process mapping.
Process Mastering
Ray Wilson and Paul Harsin, Productivity Press, 1998
Good focus, method independent, does what it says on the tin.
Process Management
Martyn Ould, BCS, 2006
A good view of modeling and managing processes
Process Change
Paul Harmon, Morgan Kaufman, 2003
Excellent insights and tips into processes, and how they fit into the value chain and organisational models.
Improving Performance, How to Manage the White Space on the Organization Chart
Geary Rummler and Alan Brache, Jossey Bass, 1995
A seminal book on the use of process mapping to understand and diagnose organisational performance.

A Certificate in Modeling Process smart·BA
distance learning programme
Self Study 'JEEP' Manual

Syllabus Section 1 exam style revision question

The model answer is on the following page. Check you answer against that and – if there are significant discrepancies – go back and review the relevant sections, If you want a review of your answers email your answer to MP@smart-BA.com. There is a charge for this service - please pay online at http://www.smart-ba.com/purchase

Scenario:
Obscure Book Collector (OBC) is a small chain of 15 shops specialising in the supply of old and obscure books. These books tend to be expensive collectors' items so the volume of transactions is low – around 10 sales per day per shop. Each shop has 2 assistants and a manager to provide a very customer focused service.

Typically, the customer enters the shop and can browse for what they want or – more often – request it from an assistant. The assistant or manager will search for editions they hold of the desired title both in the shop's stockroom and the other shops' stock via an internet based stock enquiry system. Having displayed the stock held in the shop or by the chain of shops, the customer can select which books they are interested in. The OBC employee finds the customer record by searching existing customer records for matching name and address details held in a customer database also accessible via the internet. New customers are registered by the assistant or manager completing a registration form with the customer. In the interests of customer focused service, this process needs to be as quick as possible to get the customer to the purchasing stage with the minimum of delay so the customer details are not loaded to the database until after the customer has left.

It is not uncommon for duplicate customers to be created due to different OBC employees across the chain of OBC shops spelling the customer name or address differently and so failing to find an existing customer. This is an issue for OBC in understanding it's customer base and when doing marketing mail-shots and other promotions. Having found or created the customer, payment is taken by cash or credit card using immediate payment validation via a credit card machine.

After the customer has gone, if items were sold from the stock held at the shop, the assistant needs to update the stock enquiry system with the sale. If items are sold from stock held at other shops a paper order is created and faxed to the relevant shop(s).

It is not uncommon for the shop receiving the faxed order to respond that the item has already been sold. This causes considerable customer inconvenience and disappointment, as well as significant work for the OBC employee who placed the order to refund the customer and update records of sales. Given that OBC needs to build and maintain excellent customer relationships because of the nature of the business, this is a major issue for OBC.

Question 1a
List the processes mentioned in the scenario

Question 1b
From the processes you have listed, suggest 2 that are candidates for full or partial automation.

Syllabus Section 1 exam style revision MODEL ANSWER

Question 1a
List the processes mentioned in the scenario

Examples of valid processes are
- Search stock or
    o Search shop stockroom
    o Search other shops stock
- Display stock OR
    o Display Shop stock
    o Display other shops stock
- Select books
- Find Customer
- Create Customer
- Take Payment
- Create Order
- Send Order

Note: Processes must be named Verb phrase + Noun phrase. *Marks are deducted for failure to do this.*

Question 1b
From the processes you have listed, suggest 2 that are candidates for full or partial automation.

Examples of valid processes are
- Search stock or search shop stockroom (not search other shop stock as this is already automated)
- Select books
- Create Order
- Send Order

Find Customer, Create Customer and Take Payment are already automated. Display stock is unlikely to need further automation (customers would want to handle books in stock and internet system already in place for other shop stock).

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distance learning programme
Self Study 'JEEP' Manual

Syllabus Section 2: What is a process? How to identify them.

Key points:
Definition of a process
A Process is a connected series of activities intended to achieve a business outcome.
Differences between the process view and the functional view of an organisation
A process may use functions in order to achieve the process outcome. Functions are common sub-processes or tasks that
- are used by more than one process
- typically accomplish one significant outcome in terms of either data or directing process flow

Advantages of the process view
- a process model will define the starting points for the changes the project will make
- a process model will define the finishing points for what the Business needs to achieve
- a process model defines the dependencies between processes
- processes force end-to-end thinking
- process modeling will drive out issues
- process models are a good way to communicate visually
- process models are a good way to divide work

Importance of metrics
Project Objectives define if the project is successful. Process Metrics can be thought of as process objectives or goals: measures and targets that – if achieved – define that the process is successful.

Value chain analysis
The concept is that a calculation can be performed that defines whether a process has intrinsic value in terms of the whole process:

Value of processed goods or information > (value of item + value added by each task) – costs of processing item

Relationships between processes
- A Process Model shows the dependencies between process steps: the routes through a process and the conditions under which routes can be taken
- A process always passes control on when it completes
- Sometimes processes pass data on when they complete

Building an organisational view of processes
An organisational view of processes can be used by the organisation in order to understand the impact of process changes to the organisation:
- Who is using the process
- What job roles they perform
- What organisational structures they are part of
- Where the process is used
- The systems used
- Externals the process interacts with
- Data used
- Operational constraints
- Service Levels
- Etc!

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distance learning programme
Self Study 'JEEP' Manual

Detail:
**Definition of a process**
A Process is a connected series of activities intended to achieve a business outcome.

- Definitions of process
    - o A process is a connected series of business activities (at the lowest level these are tasks) designed to produce a meaningful outcome for the business. It caters for all transactions in scope (i.e. it is not at the transaction level like the procedure is).
    - o Oxford English Dictionary
        - ▪ a series of actions or steps towards achieving a particular end
        - ▪ (Computing) operate on (data) by means of a program
    - o Merriam Webster Dictionary
        - ▪ a series of actions or operations conducing to an end
    - o Example process: "place order". Process should always be named as verb and noun – something is being done (verb or verb phrase) to something (noun or noun phrase).
    - o The name should represent the business intent of the process, not a particular activity. Example, Place Order and not Associate Product With Customer.
- Identifying Processes
    - o Top level processes: Arguably the easiest level to identify as there a good set of guidelines for identifying a process:
        - ▪ Guideline of **mutual dependency**: if you conclude that Process A is always performed when Process B is performed, and that the only time Process A is performed is when Process B is performed then these processes should be combined in to one process. Example: Suppose that whenever the Process Create Customer is performed, the process Check Credit Rating is performed and the only time that Check Credit Rating is performed is when Create Customer is performed. In this case, combine these processes.
        - ▪ Guideline of **initiation and outcome linkage**: if you conclude that whenever Process A is invoked *under certain circumstances* it will always result in initiating Process B (and/or outputs) and when Process A is invoked *under different circumstances* it always invokes Process C (and/or outputs) then it is *likely* that Process A has 2 or more processes combined in it and should be split out. Example: When Create Customer is invoked for a normal customer then the business rule is that the next process is always Place Order. When Create Customer is invoked for a customer who is also a company employee, then the business rule is that next process is always Authorise Employee Customer. In this case it is likely that Create Customer has another process in it (Create Employee Customer).
        - ▪ Guideline of **user concurrency**: If a process needs 2 or more different Job Roles in order to execute then it is highly likely there are 2 or more different processes in it unless there is a business rule that says this process must be executed by these job roles at the same time. Example: If the process Authorise Employee Customer needs authorisation by Employee Line Manager role and Sales & Marketing Director role then consider having 2 processes because without doing this once Employee Line Manager role has authorised the Employee Customer the process will wait until the Sales & Marketing Manager has also authorised it (until which time that process is effectively halted)!
        - ▪ Guideline of **meaningful outcome**: If Process A does not produce any meaningful (to the Business) outcome or output then consider merging with the preceding or following process.. Which process to merge with should be assessed using the other guidelines. Example: the process Record Customer Date Of Birth does not produce a meaningful outcome and can be combined under the guideline of mutual dependency with Create Customer
    - o Any level processes and tasks
        - ▪ Guideline of **unit of work**: if it is conceivable that the process could or should be halted so that other processes can be started, then split the process. Example: The process Create Customer might contain the logic to record marketing preferences. This information is not required to Place Order so consider splitting Create Customer in to 2 processes: Create Customer and Record Marketing Preferences (which could be done at a more convenient point).
        - ▪ Guideline of **conciseness of specification**: if it is not possible to specify the execution logic on one page then consider splitting the process. This guideline is weaker than most.

- ▪ Guideline of **transaction steps**: if a process performs only a few or one action then consider merging with other processes using the other guidelines. Example: Record Customer First Name and Record Customer Surname are probably part of the same process!

Differences between the process view and the functional view of an organisation

- **A process may use functions in order to achieve the process outcome. Functions are common sub-processes or tasks that**
  - o are used by more than one process
  - o typically accomplish one significant outcome in terms of either manipulating data (create, update, delete) or directing process flow
- Definitions of a function
  - o A function is a reusable set of execution logic which, given a set of inputs is capable of producing a set of outputs. Example – the function "Find Customer" is used in the process "Place Order" and "Cancel Order".
  - o Oxford English Dictionary
    - ▪ a computer operation corresponding to a single instruction from the user
  - o Merriam Webster Dictionary
    - ▪ any of a group of related actions contributing to a larger action
    - ▪ a computer subroutine: one that performs a calculation with variables provided by a program and supplies the program with a single result
- Process models show sequences between processes. Function Hierarchies show functional decomposition – they are not used very often these days as they only show the hierarchy and no sequence flow:
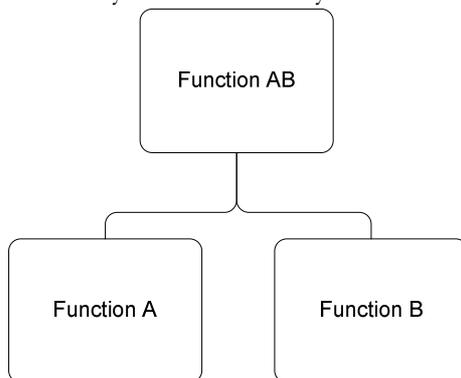
Function Hierarchy Diagram

Notes:
1. this diagram states that Functions A and B are all used by more than one process. That is, Function A is a task in more than one process as is Function B as is Function AB.
2. If it was not the case that Function A and/or Function B was not used by more than one process (i.e. is a reused component) then there would be no reason to decompose Function AB.
3. There is absolutely no sequence implied: Function A is not followed by Function B – all the diagram tells you is that Function AB comprises Function A and Function B. This allows Function AB, Function A and Function B to be used in different sequences by different processes.

Advantages of the process view

- **a process model will define the starting points for the changes the project will make**
  - o The top level process model will have a number of starting events. These are events that happen externally to the scope of the solution and to which the solution must be able to respond. Note that the events are not necessarily external to the organisation, just the scope of the solution. Example: there may be an event "Manager Authorisation Received" which triggers the process "Authorise Purchase". The manager is part of the organisation, but when they choose to authorise is out of the scope of the solution. The first process that the solution provides is "Authorise Purchase" – this is the start of the scope of the solution.
- **a process model will define the finishing points for what the Business needs to achieve**
  - o The same point as the last one, but this time referring to where the scope of the solution ends which may or may not be external to the organisation.
- **a process model defines the dependencies between processes**

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Self Study 'JEEP' Manual

- o A process is dependant on certain events or flows to trigger it and in turn triggers certain flows directly or indirectly to other processes, which are therefore dependant on that process to trigger them. What the process model shows is all the processes in scope of the solution and the dependencies between them and the events they are triggered by or trigger.
- **processes force end-to-end thinking**
  - o Process models start with at least one starting event and conclude with at least one terminating event. To that extent they encourage thinking end to end in terms of the scope of the solution.
- **process modeling will drive out issues**
  - o At each process step it is natural to consider all the possible entries and exits from the process for different scenarios. Issues such as processes that have no exit for a particular scenario will be surfaced. Example: A process called "Credit Check" has an optional flow that triggers the next process when the customer passes the credit check. The question naturally arises – what happens if the customer fails the credit check? What process is triggered in that scenario?
- **process models are a good way to communicate visually**
  - o Humans think well in pictures: it encapsulates a lot of information without having to write lots of text to explain the various dependencies between process steps.
- **process models are a good way to divide work**
  - o If processes are defined well (see sub-section Identifying Processes earlier in this section) then Business Analysts can work on fully decomposing the process and specifying the process execution logic and non-functional requirements without duplicating the efforts of another business analyst working on another process. Example: If 2 processes are defined poorly such as "Create Prospect" and "Create Customer" and both have a process scope of recording the person's name, then one process can implement one set of rules such as only record a person's middle name initials and the other can implement a rule that the full middle name must be recorded. Ideally, there should be one process that records the person's name and one set of rules concerning middle names.

Importance of metrics

Project objectives define if the project is successful. Process Metrics can be thought of as process objectives or goals: measures and targets that – if achieved – define that the process is executing successfully.

- Some Process Metrics will map directly to project Objectives – for example a process metric might be to support process execution within 20 seconds which maps to a project Objective of increasing throughput by 50% (assuming that the current process only supports process execution of 40 seconds).
- Some Process Metrics will not map directly to project Objectives but will be used during User Acceptance Testing to assess whether the process is fit for purpose or not. For example, how much manual intervention is required or how often an exception output is generated.
- Agreed and signed-off metrics will allow proof of how good the process is to be objectively stated, verified and inspected historically.
- Most process metrics will be used for operational reporting to understand how well the business is operating.

Value chain analysis
The concept is that a calculation can be performed that defines whether a process has intrinsic value in terms of the whole process:
Value of processed goods or information > (value of item + value added by each task) – costs of processing item

Given that a value chain is a chain of tasks, a value chain is a process. Products (goods or data) pass through the process and at each task the product gains some value. The process gives the products more added value than the sum of added values of all tasks. It is important not to mix the concept of the value chain with the costs occurring throughout the tasks. A diamond cutter can be used as an example of the difference. The cutting activity may have a low cost, but the task adds to much of the value of the end product, since a rough diamond is significantly less valuable than a cut diamond.

There are certain generic processes that apply to most organisations to some extent. Value chain analysis categorizes the main ones as: inbound logistics, operations (production), outbound logistics, marketing and sales (demand), and services (maintenance). The "support processes" include: administrative infrastructure management, human resource management, information technology, and procurement. The costs and value drivers are identified for each value process.
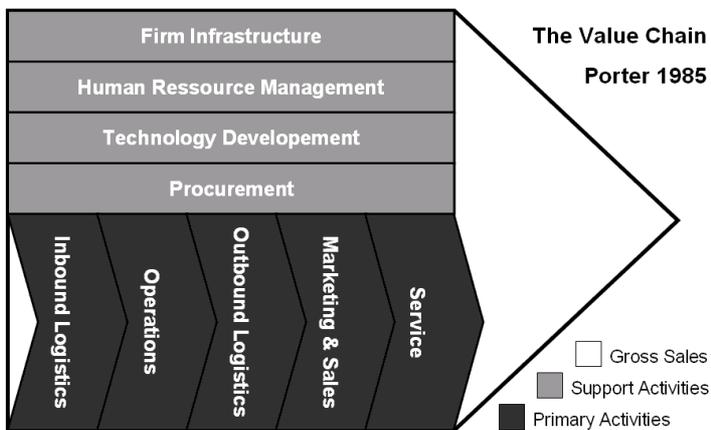
Relationships between processes
- **A process model shows the dependencies between process steps (which may be processes or tasks): the routes through a process and the conditions under which routes can be taken**
  - o Remember that processes can be decomposed in to sub-process or tasks
  - o Consider the following process model:
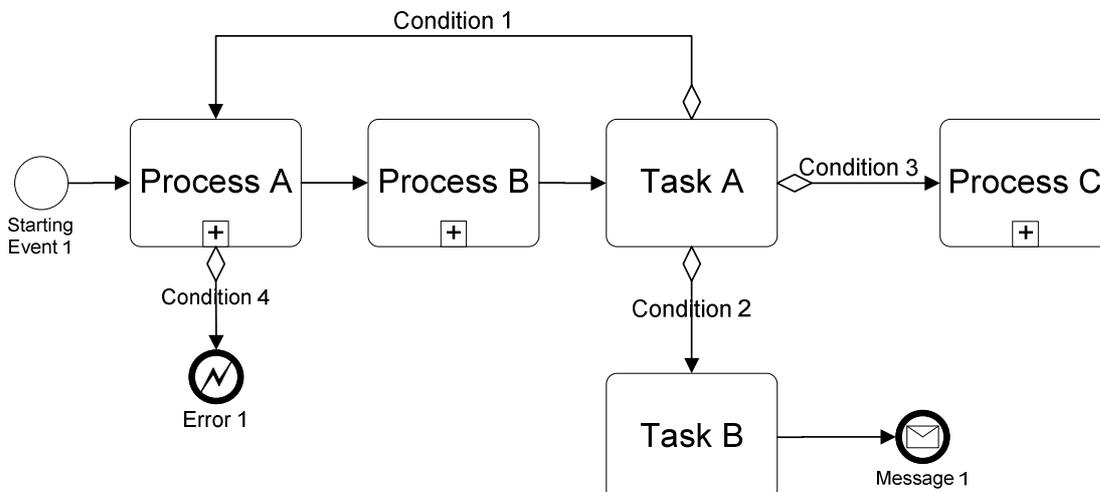
  - o The following statements are dependency rules that the diagram defines:
    - ▪ Process B always follows Process A with no exceptions
    - ▪ When Condition 4 occurs Error 1 occurs *as well* as the first point
    - ▪ Task A can initiate Process A, Process C and Task B in any combination

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- ▪ Task B always produces Message 1 with no exceptions
- o Learning point: Condition 1, Condition 2 and Condition 3 may be mutually exclusive but that is not shown by the diagram – it would be specified in the process execution logic of Task A. If you wanted to show the mutual exclusivity on the diagram it could be shown thus using a *gateway* (See Section 3 Modeling Processes for details on BPMN symbols and usage):
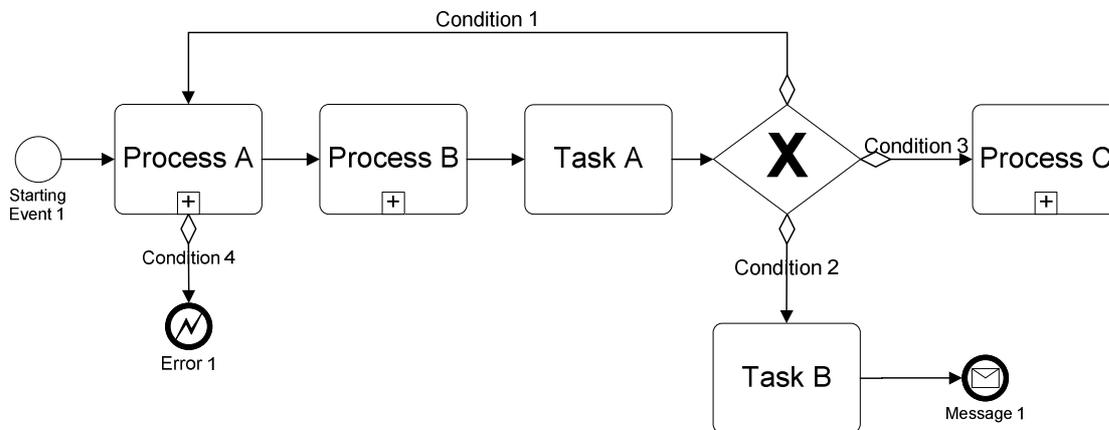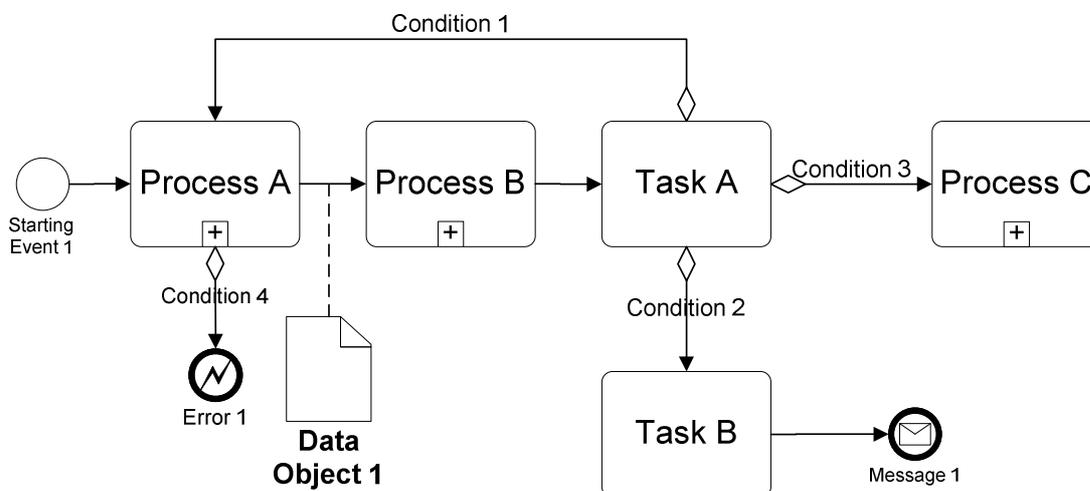

However, the logic to specify the mutual exclusivity will still have to be specified in Task A and so the symbol is redundant duplicated information that would have to be updated if the process execution rules changed.

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- **A process or task always pass control on when it completes**
  - o You can see from the process model that the arrows indicate which process or task has control next or whether the overall process has competed and there is a 'terminating event' such as a message being sent – this is the flow of control through the process model.

- **Sometimes processes or tasks pass data on when they complete**
  - o Although this undoubtedly true it is assumed that in any event driven process models that any process or task can access any data it needs to at any point: it does not have to read through sequential files or have any other physical or technical issues with accessing data. Therefore it is not usually necessary to show the flow of data between process or tasks. Note that data usage will be specified for each Task within the process specification.
    From the BPMN Specification: "*In BPMN, a Data Object is considered an Artifact and not a Flow Object. They are considered an Artifact because they do not have any direct affect on the Sequence Flow or Message Flow of the Process, but they do provide information about what the Process does. That is, how documents, data, and other objects are used and updated during the Process. While the name "Data Object" may imply an electronic document, they can be used to represent many different types of objects, both electronic and physical.*"
  - o Example:

Building an organisational view of processes
An organisational view of processes can be used by the organisation in order to understand the impact of process changes to the organisation:

- **Who is using the process/task**
  - o The names of people using the process/task
- **What job roles they perform**
  - o The job roles that are allowed to use the process/task. Note that one person can hold many job roles as this may or may not refer to the title under which they are employed. Example: a process/task may be assigned to a Sales Team Leader (employment title and job role) and System Administrator (job role only).
- **What organisational structures they are part of**
  - o A link can be established between job roles (where they are equivalent to employment titles) and/or individuals and their place in the organisational hierarchy. Example: Sales Team Leader is part of the Sales & Marketing Dept.
- **Where the process/task is used**
  - o The physical locations where a process/task can be used. This can be derived from who is using the process/task and where they are located.
- **The systems used**
  - o The IT systems that are currently used to perform the process/task. *Because* a process/task is analysed it is in scope and it follows that any IT systems that are currently used will in most cases be in scope (unless specifically excluded).
- **Externals the process/task interacts with**

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- o An external is a person, role, organisation or IT system that is external to the scope of the project (i.e. will not be changed by the project) that the solution the project develops will interact with. Example: A Customer (who purchases goods) is an external that the Sales Team Advisor role interacts with (which is part of the solution as what they do and how they do it will be changed by the solution the project delivers) during the Take Order process.
- **Data used**
  - o The data items on the data model that the task Creates, Reads, Updates and/or Deletes (CRUD). Note that a task can perform many operations on data . Example: The Record Sale task reads Customer and Product, and creates Sale.
- **Operational constraints**
  - o There may be factors which constrain what can be done by a process or task or limit what it can do. Example: it may be the case that the organisation demands 2 levels of authorisation of sales to employees.
- **Service Levels**
  - o Specifications of how fast the process/task must execute and/or availability of the task/process. Example the process "Take Order" must be capable of completing the transaction within 20 seconds.
- **Etc!**
  - o Anything else that you can justify as relevant. There are no hard and fast rules for what is included or excluded.

- **IMPORTANT NOTE: most of these items can also be categorised as Non-Functional Requirements and every task (or process if they apply to every task within the process) will have Non-Functional Requirements documented for them (*See Section 3 Modeling Processes for details on BPMN symbols and usage)*.**

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Further Reading for Syllabus Section 2

Business Analysis – Debra Paul and Donald Yeates
Published by: The British Computer Society
ISBN 1-902505-70-0
Relevant Chapters/sections:
Chapter 9 – Modeling Processes

A Pragmatic Guide to Process Modeling by Jon Holt
Published by: The British Computer Society
ISBN: 978-1-912505-66-4
Relevant Chapters/sections:

Chapters 1 & 5

Extracts from the IIBA UK Chapter – BA Recommended Reading List

The Basics of Process Mapping
Robert Damelio, Productivity Inc, 1996
A slim pocket book introducing at a very elementary level notation for process mapping.
Process Mastering
Ray Wilson and Paul Harsin, Productivity Press, 1998
Good focus, method independent, does what it says on the tin.
Process Management
Martyn Ould, BCS, 2006
A good view of modeling and managing processes
Process Change
Paul Harmon, Morgan Kaufman, 2003
Excellent insights and tips into processes, and how they fit into the value chain and organisational models.
Improving Performance, How to Manage the White Space on the Organization Chart
Geary Rummler and Alan Brache, Jossey Bass, 1995
A seminal book on the use of process mapping to understand and diagnose organisational performance.

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Syllabus Section 2 exam style revision question

The model answer is on the following page. Check you answer against that and – if there are significant discrepancies – go back and review the relevant sections. If you want a review of your answers email your answer to MP@smart-BA.com. There is a charge for this service - please pay online at http://www.smart-ba.com/purchase

Scenario:
Obscure Book Collector (OBC) is a small chain of 15 shops specialising in the supply of old and obscure books. These books tend to be expensive collectors' items so the volume of transactions is low – around 10 sales per day per shop. Each shop has 2 assistants and a manager to provide a very customer focused service.

Typically, the customer enters the shop and can browse for what they want or – more often – request it from an assistant. The assistant or manager will search for editions they hold of the desired title both in the shop's stockroom and the other shops' stock via an internet based stock enquiry system. Having displayed the stock held in the shop or by the chain of shops, the customer can select which books they are interested in. The OBC employee finds the customer record by searching existing customer records for matching name and address details held in a customer database also accessible via the internet. New customers are registered by the assistant or manager completing a registration form with the customer. In the interests of customer focused service, this process needs to be as quick as possible to get the customer to the purchasing stage with the minimum of delay so the customer details are not loaded to the database until after the customer has left.

It is not uncommon for duplicate customers to be created due to different OBC employees across the chain of OBC shops spelling the customer name or address differently and so failing to find an existing customer. This is an issue for OBC in understanding it's customer base and when doing marketing mail-shots and other promotions. Having found or created the customer, payment is taken by cash or credit card using immediate payment validation via a credit card machine.

After the customer has gone, if items were sold from the stock held at the shop, the assistant needs to update the stock enquiry system with the sale. If items are sold from stock held at other shops a paper order is created and faxed to the relevant shop(s).

It is not uncommon for the shop receiving the faxed order to respond that the item has already been sold. This causes considerable customer inconvenience and disappointment, as well as significant work for the OBC employee who placed the order to refund the customer and update records of sales. Given that OBC needs to build and maintain excellent customer relationships because of the nature of the business, this is a major issue for OBC.

Question 1a
For the process Find Customer within the scenario suggest 2 process metrics

Question 1b
For the process Find Customer define 3 aspects of the Organisational View of the process

Syllabus Section 2 exam style revision question   MODEL ANSWER

Question 1a
For the process Find Customer within the scenario suggest 2 process metrics
1.   Speed of process
2.   No of duplicate customers created

Question 2b
For the process Find Customer define 3 aspects of the Organisational View of the process
Any 3 of the following:
1.   The process can be used by Assistants
2.   The process can be used by Managers
3.   The process uses Customer data
4.   The process is available in all OBC shops
5.   The process is available during OBC shop opening hours
6.   The process is available over the internet

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Syllabus Section 3: Modeling Processes

Key points:

- BPMN is the industry standard notation for modeling processes.
- A process model defines dependencies between process steps.
- The process/task specification defines the execution logic that the process/task implements.
- Every process/task will have a set of non-functional requirements defined as well.
- Stakeholders as classified as Operators, Beneficiaries or Suppliers to process.

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Detail:
BPMN is the industry standard notation for modeling processes.
You are allowed to use almost any notation standard you like that is a recognised standard, with the exception of Data Flow Diagrams which are no longer allowed.
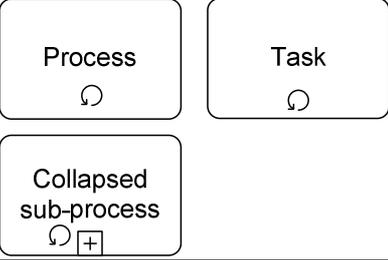BPMN is an extensive notation set but we will focus on those you need in order to pass the exam. See the "Further Reading" section for details on further notation.

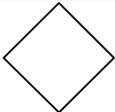BPMN process models consist of symbols for different types of
-   swimlane
-   activities
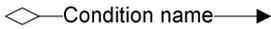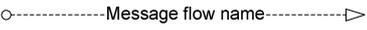-   events
-   gateways
-   flows

The following table shows the different symbol types and their meaning (all definitions taken from http://www.bpmn.org/Documents/BPMN%201-1%20Specification.pdf and http://www.modernanalyst.com/Resources/Templates/tabid/146/articleType/ArticleView/articleId/487/Default.aspx)

Type of symbol	Symbol name	Symbol	Description
Swimlane			A Swimlane is a graphical container for partitioning a set of activities from other activities. BPMN has two different types of Swimlanes.
	Pool	Pool	A Pool represents a Participant in a Process. It also acts as a "swimlane" and a graphical container for partitioning a set of activities from other Pools, usually in the context of B2B situations. It is a square-cornered rectangle that is drawn with a solid single line. A Pool acts as the container for the Sequence Flow between activities. The Sequence Flow can cross the boundaries between Lanes of a Pool, but cannot cross the boundaries of a Pool. The interaction between Pools, e.g., in a B2B context, is shown through Message Flow.
	Lane	Pool Lane	A Lane is a sub-partition within a Pool and will extend the entire length of the Pool, either vertically or horizontally. Lanes are used to organize and categorize activities within a Pool. The meaning of the Lanes is up to the modeler.
Activity			**Always named Verb phrase+Nown phrase: do something to something. Marks are deducted for failure to follow this simple rule.** An activity is a generic term for work that a company or organization performs via processes. An activity can be atomic or non-atomic (compound). The types of activities that are a part of a Process Model are: Process, Sub-Process, and Task.

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Type of symbol	Symbol name	Symbol	Description
	Process	Process	A Process is any activity performed within a company or organization. In BPMN a Process is depicted as a network of Flow Objects, which are a set of other activities and the controls that sequence them.
	Sub-process	Collapsed sub-process ⊞	A Sub-Process is a Process that is included within another Process. The Sub-Process can be in a collapsed view that hides its details. A Sub-Process can be in an expanded view that shows its details within the view of the Process in which it is contained. A Sub-Process shares the same shape as the Task, which is a rectangle that has rounded corners.
	Task	Task	A Task is an atomic activity that is included within a Process. A Task is used when the work in the Process is not broken down to a finer level of Process Model detail. Generally, an end-user and/or an application are used to perform the Task when it is executed. A Task object shares the same shape as the Sub-Process, which is a rectangle that has rounded corners.
	Iteration	Process ↺ Task ↺ Collapsed sub-process ↺ ⊞	To show that a process, sub-process or task can be performed from 1 through to any number of times defined by the processing logic in the iteration object.
Event			An event is one of: • something that occurs externally to the solution that the solution has to respond to • a break in the process that means the process will not resume until another external event occurs • a product the solution produces as output and that product leaves the scope of the solution • the solution terminating. The event may have a symbol inside that indicates the type of event. Not all symbols are relevant to all types of events.

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Type of symbol	Symbol name	Symbol	Description
	Symbols within events	✉ Message ⇨ Link ✡ Multiple ⚡ Error ◁◁ Compensation 🕐 Time ▤ Rule ✕ Cancel	• Message: data that arrives to or is produced by the solution. • Link: a mechanism for connecting two sections of a Process. Link Events can be used to create looping situations or to avoid long Sequence Flow lines. Link Event uses are limited to a single Process level (i.e., they cannot link a parent Process with a Sub-Process). Paired Intermediate Events can also be used as "Off-Page Connectors" for printing a Process across multiple pages. They can also be used as generic "Go To" objects within the Process level. There can be multiple instances of a Source Link Event, but there can only be one Target Link Event. • Multiple: any combination of the types of event. • Error: an error has occurred and this symbol will be in an event physically on the border of the process that can generate it. • Compensation: undoing activities that have taken place. • Time: A specific time-date or a specific cycle (e.g., every Monday at 9am) can be set. • Rule: an event that occurs when an external condition such as "Temperature above 300C" becomes true. • Cancel: used within a Transaction Sub-Process to cancel their execution
	Start event	◯ Start Event – no trigger ✉ Start Event – message trigger ▤ Start Event – rules trigger ✡ Start Event Multiple conditions 🕐 Start Event – timer trigger ➡ Start Event – link trigger	A Start Event indicates where a particular Process will start. In terms of Sequence Flow, the Start Event starts the flow of the Process, and thus will not have any incoming Sequence Flow. A Start Event can have a Trigger that indicates how the Process starts: Message, Timer, Rule, Link or multiple (any combination). The Start Event shares the same basic shape of the Intermediate Event and End Event, a circle, but is drawn with a single thin line.

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| Type of symbol	Symbol name	Symbol	Description
	Interme-diate event	Message Link No type Multiple Error Compensation Time Rule Cancel	An Intermediate Event is an event that occurs after a Process has been started. It will affect the flow of the process, but will not start or (directly) terminate the process. An Intermediate Event will show where messages or delays are expected within the Process, disrupt the Normal Flow through exception handling, or show the extra flow required for compensating a transaction. The Intermediate Event shares the same basic shape of the Start Event and End Event, a circle, but is drawn with a thin double line.
	End event	No type Message Compensation Error Terminate Link Multiple Cancel	As the name implies, the End Event indicates where a process will end. In terms of Sequence Flow, the End Event ends the flow of the Process, and thus, will not have any outgoing Sequence Flow. An End Event can have a specific Result that will appear as a marker within the centre of the End Event shape. The End Event shares the same basic shape of the Start Event and Intermediate Event, a circle, but is drawn with a thick single line
Gateway			A Gateway is used to control the divergence and convergence of Sequence Flow. Thus it will determine branching, forking, merging, and joining of paths. Internal markers will indicate the type of behavior control. There are five types of gateways.
	Exclusive or	Xor condition Xor condition	Data-Based exclusive decision and merging. Shown with or without the "X" marker – i.e. the default is Xor.
	Inclusive or	Inclusive or condition	Inclusive decision and merging
	And	And condition	Simultaneous forking or joining
	Complex	Complex condition	Complex conditions and situations (e.g., 3 out of 5 times go one way, 2 times out of 5 go the other)

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Type of symbol	Symbol name	Symbol	Description
	Event based gateway	*(this symbol is not named)*	An "exclusive or" decision made on the basis of whichever associated intermediate event occurs first.
Flow			A Flow is a graphical line connecting two objects in a BPMN diagram. There are two types of Flow: Sequence Flow and Message Flow, each with their own line style. Flow is also used in a generic sense (and lowercase) to describe how Tokens will traverse Sequence Flow from the Start Event to an End Event.
	Sequence flow	⟶	Flow that proceeds, unrestricted, from one Flow Object to another, via a Sequence Flow link, without any dependencies on another flow or any conditional expressions. Typically, this is seen as a Sequence flow between two activities, without a conditional indicator (mini-diamond) or any intervening Gateway.
	Sequence flow with condition	◇—Condition name⟶	Flow that proceeds from one Flow Object to another, via a Sequence Flow link, but is subject to either conditions or dependencies from other flow as defined by a Gateway. Typically, this is seen as a Sequence flow between two activities, with a conditional indicator (mini-diamond) or a Sequence Flow connected to a Gateway.
	Message flow	○-------Message flow name------▷	A Message Flow is a dashed line that is used to show the flow of messages between two entities that are prepared to send and receive them. In BPMN, two separate Pools in the Diagram will represent the two entities.
	Data Object	**Data Object 1**	In BPMN, a Data Object is considered an Artifact and not a Flow Object. They are considered an Artifact because they do not have any direct affect on the Sequence Flow or Message Flow of the Process, but they do provide information about what the Process does. That is, how documents, data, and other objects are used and updated during the Process. While the name "Data Object" may imply an electronic document, they can be used to represent many different types of objects, both electronic and physical.
Text annotation		Annotation text	Can be applied to any object on a BPMN diagram to add clarity. Is for communication purposes only and does not form part of the specification.

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A process model defines dependencies between process steps.

Have a look at the following example process model. You should be able to read and understand how the process

- starts
- who is involved with the process
- what processes it goes through
- under what conditions which flows will be followed
- how it terminates

The process being modeled is customer query handling by 1st and 2nd line support teams, who use an external agency to solve technical queries.
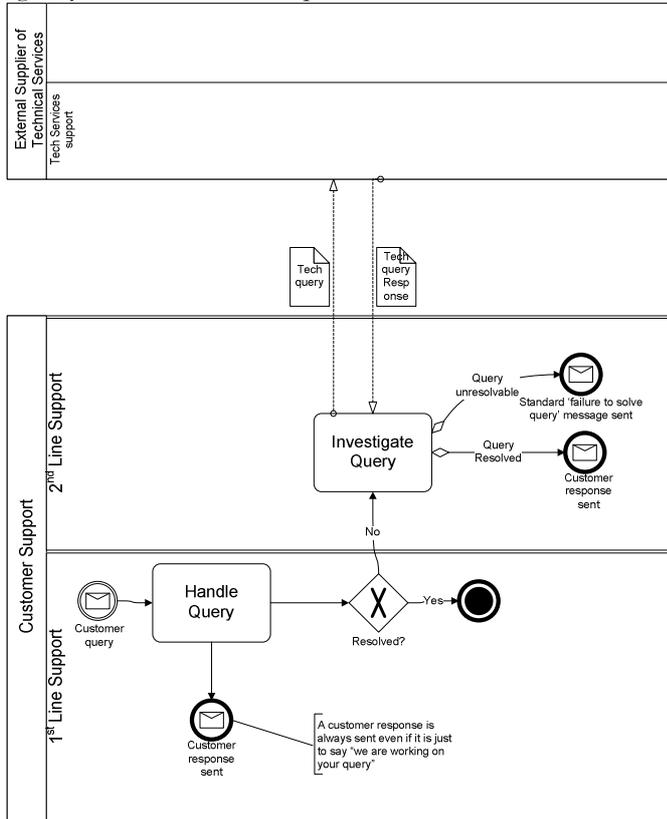

Notes:
1. There is an xor gateway called 'resolved' which does essentially the same job as the two conditional flows coming from "investigate query". The only difference is that although you would expect the two conditional flows to be mutually exclusive the diagram does not enforce the rule – conditional flows will be followed when the conditions are satisfied and two conditions could be satisfied at once (see next example).
2. The default for BPMN for flows leaving a process, sub-process or task is that they all leave at the same time unless there is some rule in the diagram that says they cannot – in the example above the task flow from "handle query" to "customer response sent" and to the gateway "resolved?" both occur as that task concludes.

Some more notes about BPMN usage:
Consider the following process
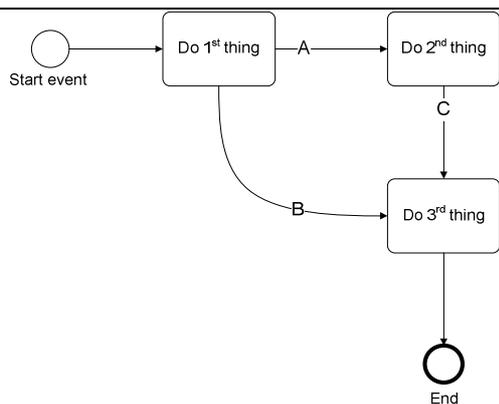
The task "Do 1st Thing" has 2 flows (A and B) leaving it. As both flows are unconditional flows, these would be followed unconditionally *and simultaneously* every time.

The task "Do 3rd Thing" has 2 flows (A and C) coming in to it. The default notation for BPMN is that **either** flow A **or** flow C can trigger the task.

If you wanted to show the business rule that flows A **and** C are required before the task can start you would show it like this:
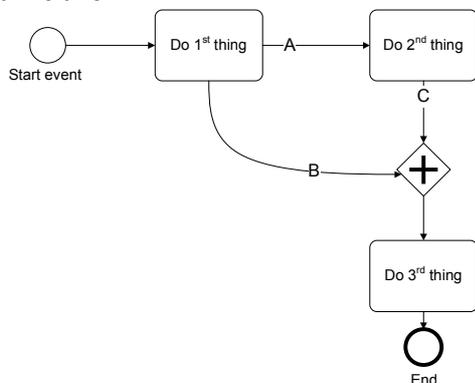
Process breaks:

There is a process break between "Do 1st Thing" and "Do 2nd Thing". That break comes to an end when the intermediate event "message received" occurs.

Suppose the business rule is that the message must be received within 3 days or the process stops:
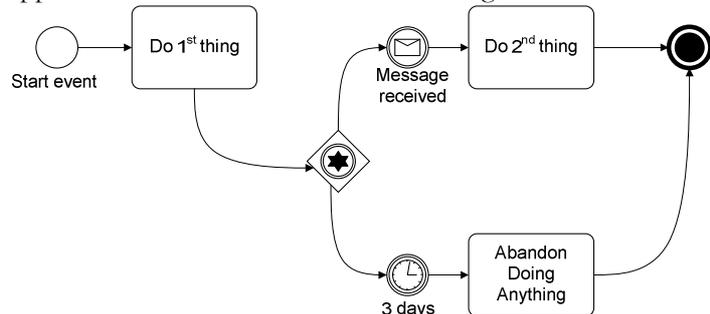
Note the use of the event based gateway. It shows that there is a process break here which will end when one of any number of events occurs.

There are plenty more examples of process models in the reading list.

The process/task specification defines the execution logic that the process implements.

Processes (by definition) are not the bottom or atomic layer in a process model – they will always be decomposed: sometimes to sub-processes, sometimes to tasks (the bottom layer).

Definition of the process is therefore going to be a summary definition of the sub-processes and tasks within them.

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It is not feasible (or desirable) to specify precise execution logic for a process as it would be impossible to ascertain which task each statement belonged to.

What is useful to define at the process level is

1. Description *of the process at the level shown on the diagram.*
2. Process Metrics (see section 2) *provided that they apply only to the process at the level it is shown on the diagram.*

Tasks (by definition) are the bottom or atomic layer of a process model.

Therefore it will be necessary to specify

1. a description of the task
2. the precise logic that must be executed by the task.

In addition, the following should be specified *where not present in the processes that the task is a part of*:

1. Task Metrics (see section 2)

Description of a process/task: a natural English description of what the process is for and an overview of how it does it.

An example description for Take Order process:

"The process Take Order captures the details of a customer instruction for a sale.

First the customer is found by using certain search criteria (if not found a customer can be created) and then the product selected and a sale price is agreed and recorded."

Execution Logic: there are a variety of ways of doing this ranging from natural English to highly specialised and formalised languages such as Zed. The most common methods that strike a balance between these 2 extremes are Structured English and pseudo-code.

Structured English uses English to describe the bulk of the specification with certain reserved words/phrases that need to be agreed upon by all who are going to create and use the logic.

The reserved words and phrases typically include

- Create
- Read
- Update
- Delete
- For each … end for each
- If … else … end-if
- Go to
- Display
- Input
- Prompt

Example:

Prompt the user to input a Customer Name
Read Customers
For each Customer where the Customer Name = input Customer Name
       Display Customer Name
            Customer Address
            Customer Number
End for each
If no Customers were found
       Then invoke the task Create Customer
End if

Pseudo-code takes this one stage further and represents the logic in the programming style of the language to be used to code the solution. As such it will use the syntax of that language.

Example:

Procedure Find_Customer
Declare Input_Customer_Name Char(50) init(")
Declare Found Boolean init False
Display "Please enter the customer name: " & Input_Customer_Name

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```
Do while ¬EOF Customer
        Read Customer
        If Customer.Name = Input_Customer_Name then
                Display Customer_Name
                Display Customer_Address
                Display Customer_Number
                Found=True
        End-if
End Do-while
If ¬Found then go to procedure Create_Customer
End-if
```

In either case or any other technique used, it is the business rules that must be defined and not program code. Example, setting pointers or maintaining referential integrity.

Every process/task will have a set of non-functional requirements defined as well.
Non-functional requirements: There is no hard and fast definition of a non-functional requirement. In fact, even it's name only states what it is *not* rather than what it *is*.
Every project has non-functional requirements and they can relate to the whole solution (i.e. all processes and data within the solution) and/or to processes (i.e. all sub-processes and tasks within the process), tasks or data.
The *usual* ones are
- Who can use it (names, job roles, system roles, etc). Example: Sales Order Clerk
- How many users can use it concurrently. Example: up to 100 concurrent users.
- Where (physically) it can be run. Example: The Call Centre at No 1 The High Street, Anytown.
- When it is available for use. Example: 08:00 to 18:00 Monday to Saturday excluding Bank Holidays.
- How often it is run. Example: up to 1,500 transactions per hour.
- How quickly it should execute. Example: it should take no longer than 5 seconds to find a customer.
- How reliable it should be. Example: no more than 2 un-planned system unavailable events per year.
- Any usability requirements. Example: allow the order in which data items are supplied to be customised.
- Anything else which is not a functional requirement.

Note: a lot of these elements can be built in to what is known as a Business Model (see section 2).

Non-functional requirements will need to be specified for all tasks and processes either directly or indirectly.
Processes: Non-functional requirements that **must** apply to all the sub-processes and tasks contained within a process can be specified at the process level.
Task: Non-functional requirements that do **not** apply to all tasks at that level must be specified for each task they do apply to.

Stakeholders as classified as Operators, Beneficiaries or Suppliers to process.
A stakeholder is someone or organisational unit that is impacted by the process.
From a process perspective, the stakeholders that interact with it will either be **primarily**
- Operators: they execute the process
- Beneficiaries: they receive goods and/or services from the process
- Suppliers: they deliver goods and/or services and/or data that the process needs in order to execute
Stakeholders are often shown as the swimlanes or pools on a process diagram.

Further Reading for Syllabus Section 3

Business Analysis – Debra Paul and Donald Yeates
Published by: The British Computer Society
ISBN 1-902505-70-0
Relevant Chapters/sections:
Chapter 8 – Process Modeling.

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http://www.modernanalyst.com/Resources/Templates/tabid/146/articleType/ArticleView/articleId/487/Cheat-Sheet-for-BPMN-Business-Process-Modeling-Notation.aspx – a great BPMN reminder sheet to take in to the exam.

BPMN1.1. http://www.bpmn.org/Documents/BPMN%201-1%20Specification.pdf – free
Section 11 – BPMN by example for extended model – note that this contains some notation we have not covered as it is not required for the exam.

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http://www.bpmn.org/exampleIndex.htm - a set of example BPMN diagrams – note that these contain some notation we have not covered as it is not required for the exam.

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http://www.businessprocesstrends.com/publicationfiles/07-04%20WP%20Intro%20to%20BPMN%20-%20White.pdf a good introduction from Stephen White who is on the OMG that controls BPMN with a discussion at the end about where BPMN may evolve to.

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Syllabus Section 3 exam style revision question

If you want a review of your answers by a Business Analyst please complete the question and email your answer to MP@smart-BA.com. There is a charge for this service - please pay online at http://www.smart-ba.com/purchase

Scenario:
Anytown Hospital Accident & Emergency Department (A&E) provides a point of entry in to the hospital for patients.
Patients can arrive through 2 routes: they can arrive via their own transportation or they can be brought in by ambulance.
On entry to the A&E dept patients are classified according to the severity of their condition:
- those who require immediate treatment or resuscitation (such as sever road traffic accidents and heart attacks) are rushed through to treatment or resuscitation rooms as appropriate and always admitted to the hospital.
- those who have major injury or illnesses (such as industrial accidents and elderly patients with pneumonia) are registered and prioritised. It is possible for a patient to go straight for treatment at this point if their condition justifies it. Otherwise, they wait in the waiting area for a triage nurse to become available.
- those who have minor injury or illness (such as domestic accidents or asthma) are registered and prioritised. The wait in the waiting area for a triage nurse to become available.
- children as sent to a specialist paediatric unit within the general hospital

When a triage nurse becomes available, they select the next highest priority patient and assess whether the patient can be treated and discharged or needs admission to the general hospital.

Question 1.
Draw a process model in the notation of your choice for handling A&E patients.
Note: Questions requiring you to process model always allow you to use the notation of your choice (except DFDs). The model answer to this question uses BPMN.

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Syllabus Section 3 exam style revision question   MODEL ANSWER

Question 1.
Draw a process model in the notation of your choice for handling A&E patients.
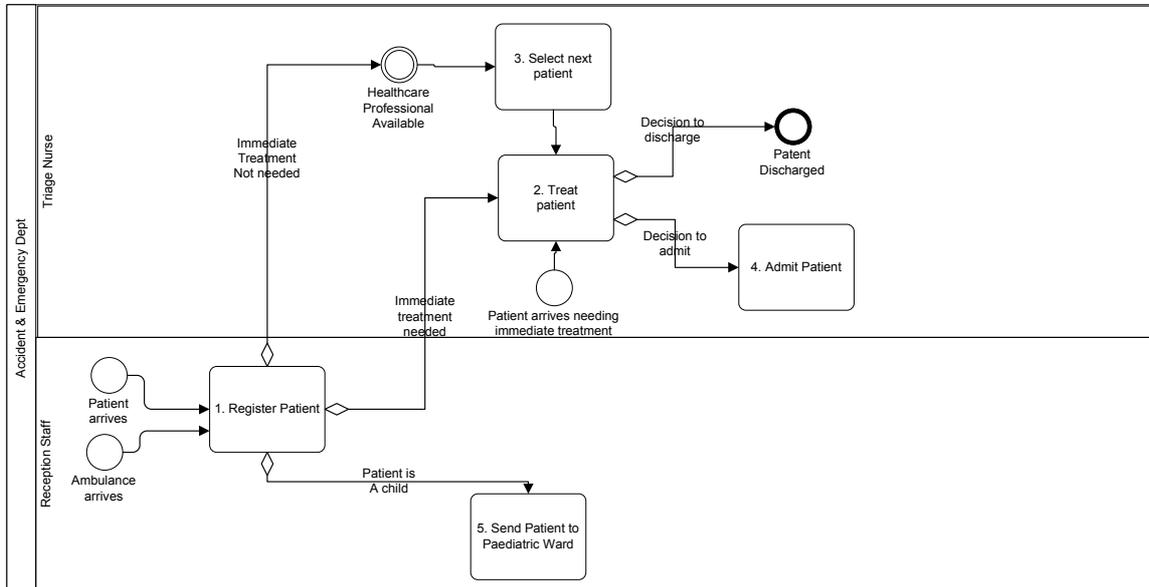
Notes:

1. *There are several different ways of drawing the above process. The exam marker will assess whether the process you draw fits the scenario.*
2. *The most common variation will be the use of gateways instead of conditional flows – this is entirely acceptable.*
3. *Processes* **must** *always be named as verb-phrase + noun-phrase. Marks are deducted for this fundamental mistake.*
4. *Pools and swim-lanes are optional unless the question explicitly asks for them.*

Syllabus Section 4: Re-engineering Processes

Key Points:

- Modeling as-is processes
  - The current way the processes operate – the starting point of the change from a process perspective
  - Producing physical and logical models
- Identifying problems with the as-is process
  - A systematic examination of current process to find issues with the current process that are in scope of the project
- Problem analysis
  - Causes – relationship to project objectives
  - Impact – relationship to project objectives
- Benchmarking
  - Define current performance metrics of the process
- Identifying inappropriate workflows
  - Dead-ends
  - Infinite loops
  - Unnecessary processes/tasks
  - Inefficient flows
- Identifying inappropriate IT automation
  - Processes that need IT automation and don't have it
  - Processes that don't have sufficient IT automation
  - Processes that have IT automation and don't need it
- Staffing issues
  - Staff resources required to run the processes
  - Organisation structure implications
- Challenging the business rules
  - Facilitating a methodical review of process rules for
    - Process metrics
    - Dependency
    - Execution logic
    - Non-functional requirements
- Modeling the to-be processes
  - Logical to-be process modeling
  - Physical to-be process modeling
- Implementing the new processes

Detail

- **Modeling as-is processes**
 - o **The current way the processes operate – the starting point of the change from a process perspective**
    - ▪ A change consists of
      - • Defining the starting point of the change
      - • Defining the completion of the change
      - • Defining the activities required to move from the start to the finish.

      There are many ways of analysing the starting point: who is currently engaged in the activities to be changed, what organisation units are they part of, what information is needed currently, what applications are currently employed and so on.

      Processes are a pivotal definition of the starting point for a change. Usually there is an existing process in place that is being changed. This process is used by people who are part of organisation structures working at various locations with certain applications manipulating certain data.
  - o **Producing physical and logical models**
    - ▪ There are 2 ways of looking at processes regardless of whether they are the current or proposed processes:
      - • Physically who is running the process, where are they (the floor and building they work in etc), and mechanically, how they operate the process. Example: A physical process could look like:
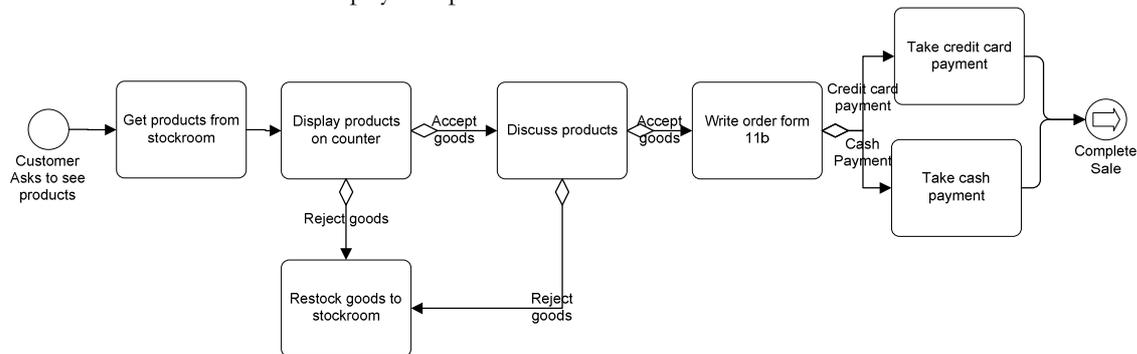
A process definition for "Write Order Form 11b" might read:
"Get an order form 11b from the tray on the counter.
  Complete the order details in black ink.
  The customer must sign the order form (in red ink) to acknowledge and confirm the order.
  Etc."

- • The logical model removes all the physicality to leave the logical essence of what is being accomplished. Logical models are only concerned with the desired business outcome that the whole process and each process step is trying to achieve.

  The logical process model for the above process might look like
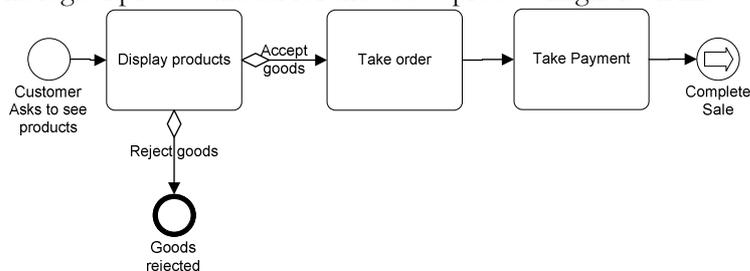
A process definition for "Take Order" might read:
"Record customer details
  o name
  o address
  Record customer authorisation of the sale.
  Etc"

- **Identifying problems with the as-is process**
  - o **A systematic examination of current process to find issues with the current process that are in scope of the project to address**
    - ▪ The "systematic examination" is facilitated by the process models: each process and the elements that go to make up each process (events, flows, tasks, outcomes, process logic) are examined from the perspective of
      - What *does* go wrong here and what is the impact
      - What *could* go wrong here and what would be the impact

      This is achieved best with current physical models.

- **Problem analysis**
  - o **Causes – relationship to project objectives**
    - ▪ Having found an issue with the as-is process it is necessary to analyse whether the issue is within scope of the current project to fix. For example, an issue with the current sales process might be that when fetching stock from the stockroom that the stock can be dusty. Is it within scope of the project to address this issue?

      This can be answered by asking another question: will addressing the issue aid the project in achieving its objectives? If "yes" then the issue resolution is in scope. If "no" then it is not. Following the example through – if the project objective is to decrease sales lost due to unstocked items, then this issue is out of scope: the sale will not be lost because the item is not stocked, and ridding the stock of dust will not change whether items are stocked or not.

      Note that the sale might be lost because the customer does not want to buy dusty goods. This may mean the project should consider further objectives or just changing the one it has, but with the objective stated as "decrease sales lost due to unstocked items" then this issue is out of scope and the project will not achieve anything recognised by the business as success in addressing the issue.
  - o **Impact – relationship to project objectives**
    - ▪ Even when the issue has been analysed and found to be in scope, it still does not mean that the project *should* address the issue.

      Consider the following 2 issues that could be addressed as part of the project
      1. sales staff not able to find stocked items due to poor cataloguing
      2. sales staff not able to find stocked items due to one product's writing not being differentiated enough for a member of staff who is colour blind.

      Suppose you had only enough resource to tackle one issue – which would you choose? You could choose issue 1 which seems to be a problem affecting stock items and staff generally. Or you could choose issue 2 which affects one item of stock for one member of staff. Clearly, you should choose issue 1 – but why? The answer is that it will have bigger impact on the project's ability to achieve its objectives.

      Note: with no resource shortage both issues should be addressed. The analysis of impact will only be useful in prioritising work when there is a resource shortage or other limitation on what the project can accomplish.

- **Benchmarking**
  - o **Define current performance metrics of the process**

    Remember: process metrics are like project objectives that apply to the process. In order to realise *project* objectives, some measure is going to be changed from one value to a target value that defines success to the project. The measures will need to be defined (what, exactly are they) and this is done in the Objectives. The current value of the measure also needs to be ascertained and this is what is done in benchmarking.

    Suppose you have a *project* objective to increase sales per advisor by 10%. The measure has been defined (sales per advisor) and the target value that defines success has also been defined (increase the measure by 10% and the project is successful). The question remains: 10% of what? What is the current level of sales per advisor. A benchmark measure needs to be made that defines the starting position of the project. For example: currently sales per advisor runs at 100 per day. This project's objective is to increase that by 10% to 110 sales per day. Any less will not be considered successful.

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Benchmarking can sometimes be very easy: Consider the relatively common type of project objective "maintain compliance with some regulation – e.g. the data protection act". The objective has already declared the benchmark (the current measure is compliance – the organisation already has it otherwise the project could not maintain it).

As we have seen, process metrics can be thought of as objectives that apply to the process. It is unlikely that a process will have as a metric "sales per advisor" or "data protection act compliance" but is likely that there will be measures that define that the process is operating optimally. For example, a process that records sales might have as a metric the number of delivery address errors made by the sales advisor (if this is important to the business and contributes in some way to the project objectives). The same principles of project objectives apply of establishing what the current error rate is (the benchmark) and what the target value should be in order to be able to declare that that the process is running satisfactorily.

- **Identifying inappropriate workflows**

    Various checks can be made to confirm the quality of the process model.

    o **Dead-ends**

        Consider the following process:
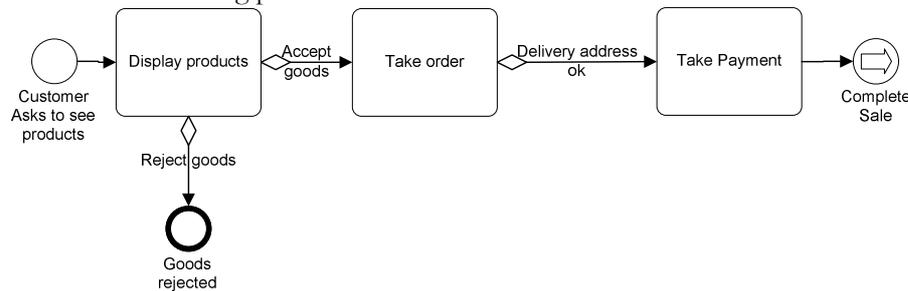
The first terminator is "Goods Rejected". If the goods are not acceptable for whatever reason this seems reasonable. However, what happens in the second process "Take Order" if the delivery address is not ok? This appears to be a dead end: the process flows in when "Accept Goods" is followed but does not flow out when the delivery address is not ok.

    o **Infinite loops**

        Consider the following process:
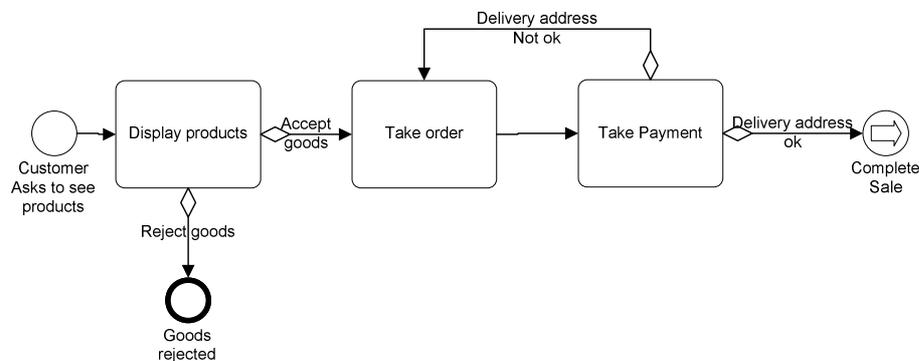
Suppose we run the process using the following scenario: a customer wants to buy goods but supplies an address for delivery that cannot be validated. The process rules on the diagram mean that having followed the flow "Accept Goods" in to the process "Take Order" the next process **must** be (unconditional process flow) "Take Payment". In "Take Payment" the address is found to be not ok so the conditional flow "Deliver Address Not Ok" is followed back to "Take Order" and the next process **must** be (unconditional process flow) "Take Payment". In "Take Payment" the address is found to be not ok so the conditional flow "Deliver Address Not Ok" is followed back to "Take Order" and so on for ever.

    o **Unnecessary processes/tasks**

        Consider the following process that has an objective to increase sales per advisor by 10%:
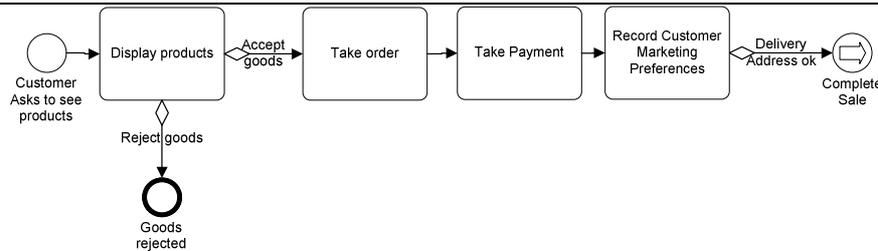
How does the process "Record Customer Marketing Preferences" contribute to the project objectives? If it does not (and in this case could actually result in less sales per advisor due to the time taken to perform the process) then the process is unnecessary – unnecessary in terms of not being necessary to achieve project objectives.
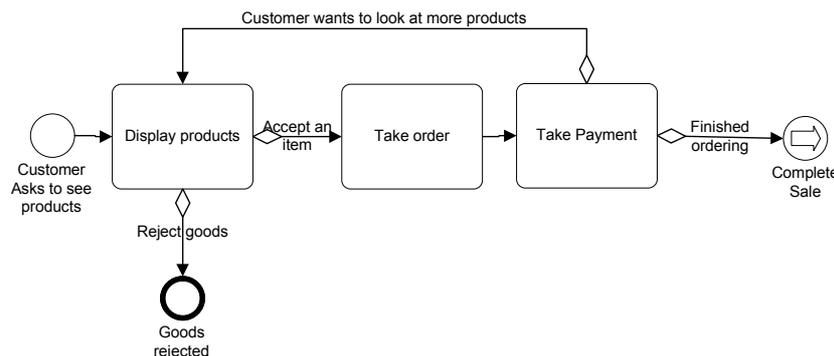
- o **Inefficient flows**

  Consider the following process:

  Notice the flow from "Display Products" to "Take Order" is now "accept an item". This results in the process forcing a customer to select products one at a time and for each one they select, process the order and take payment, before allowing them to order more products via the flow "customer wants to look at more products".

  This may be what the business needs to achieve the project objectives – or it may be just inefficient!

- • **Identifying inappropriate IT automation**

  The current as-is processes may be
  - ▪ fully manual
  - ▪ partially automated with some user input
  - ▪ fully automated with no user input.

- o **Processes that need IT automation and don't have it**

  A project has an objective to increase sales per advisor by 10%. Suppose the as-is physical process description for the process "Take Order" states

  "…the advisor checks to see if the customer is already set up as customer by requesting the customer's name, address, and date of last order from the customer.

  The advisor searches for the customer's last order in the box file of orders and – if found – uses the customer number to write a new order…a copy of which is then filed in the box file of orders".

  Bearing in mind the project objective, it would seem reasonable to suggest that this is an area for improvement.

- o **Processes that don't have sufficient IT automation**

  A project has an objective to increase sales per advisor by 10%. Suppose the as-is physical process description for the process "Take Order" states

  "…the advisor checks to see if the customer is already set up as customer by requesting the customer's name, address, and date of last order from the customer.

  The advisor searches for the customer's last order in the box file of orders and – if found – uses the customer number to generate a new order on the system…a copy of which is then filed in the box file of orders".

  Although the ordering is partially automated, and bearing in mind the project objective, it would seem reasonable to suggest that this is an area for improvement.

- o **Processes that have IT automation and don't need it**

  A project has an objective to increase sales per advisor by 10%. Suppose the as-is physical process description for the process "Take Order" states

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"…having recorded the order, the sales advisor prints a picture of the product the customer ordered and the system emails the picture to the customer as well".

While being a value-added service for the customer, this automation (printing and emailing) costs time and money to operate and yet does not contribute to the stated project objective.

- **Staffing issues**
  - o **Staff resources required to run the processes**

    In the as-is physical (or logical) process model, metrics concerned with the number of transactions and time taken to process can be measured. Straight-forward measurements of the number of staff running processes can also be recorded. Based on this information it is possible to estimate what the workload is (number of transactions multiplied by the time taken to run each transaction) and the capacity of the staff (whatever is deemed the active working time in a day multiplied by the number of staff).

    Comparing the workload to the capacity should indicate if there are any issues with resourcing the as-is process.

  - o **Organisation structure implications**
    - ▪ Organisations generally have standard manager to employee ratios. The capacity as defined in the previous section can be used to apply these standards and determine if there are any issues with the current organisation structure.
    - ▪ Processes evolve over time as business circumstances change and organisations work around short-comings in the current process. This may result in manually intensive processes and/or other issues (process delays for example).
    - ▪ Sections of organisations may end up being dedicated to manually repetitive tasks which are good candidates for IT automation.
    - ▪ Sections of organisations may end up being dedicated to very intricate and involved processes requiring a high degree of skill which may mean these processes are expensive to run and error prone.

- **Challenging the business rules**

  "We have always done it like that and if it ain't broke why fix it?".

  The project has been initiated by sponsors who are sponsoring changes to the business –the way those changes are visible to most staff will be through the changes to processes.

  The business may have always done it like that and it may currently work, but that does not take away from the fact that there are benefits to the changes that the sponsors want to achieve.

  Process models make visible for inspection, review and critique how things will work in the future. As they cover the entire scope of the change down to task level they can be used as a tool for facilitating a thorough, methodical review of the business rules as they are and as they should be.

  - o **Facilitating a methodical review of process rules for**
    - ▪ **Process metrics**

      Each process has a set of measures and target values for those measures that define whether the process is running optimally or not. All the process metrics should be contributing to achieving project objects and *at the very least* should not work against project objectives. Those that do should be challenged.

    - ▪ **Dependency**

      Each process is dependent on something(s) that trigger it. Inspecting the process models can validate the dependencies for each process. All the dependencies should be contributing to achieving project objects and *at the very least* should not work against project objectives. Those that do should be challenged.

    - ▪ **execution logic**

      Each process will execute logic to apply business rules. Inspecting each process's execution logic can validate that the business rules are being applied correctly. All the logic should be contributing to achieving project objects and *at the very least* should not work against project objectives. Those that do should be challenged..

    - ▪ **non-functional requirements**

      Each process has a set of requirements associated with it that are not concerned with functionality. Who can run the process, when, where, how often and so on. Inspecting each process's non-functional requirements can ensure that the process has everything it needs in order to be able to operate. All the non-functional requirements should be

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contributing to achieving project objects and *at the very least* should not work against project objectives. Those that do should be challenged.

- **Modeling the to-be processes**
  - **Logical to-be process modeling**

    Every functional requirement will have *at least* one process that provides that functional capability. Given this fact, take the logical as-is model and remodel it based on the changes that each functional requirement necessitates.

    Example:

    The current logical as-is model:
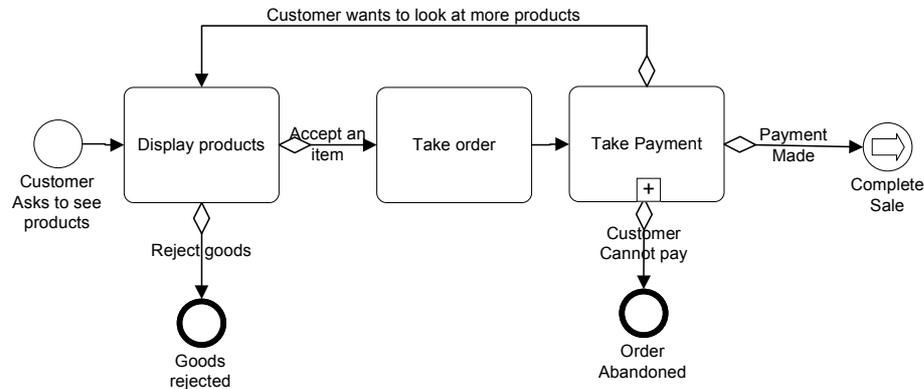
A project has been initiated and it's objective is to increase sales per advisor by 10%.

One functional requirement in order to achieve this is to allow customers to order multiple items on one order.

The to-be model that reflects the requirement and so contributes to achieving the project objective is:
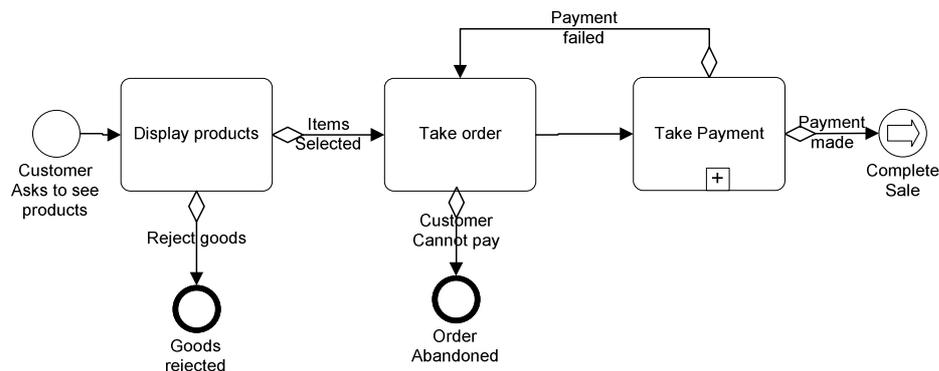
  - **Physical to-be process modeling**

    In order to see how this will work physically the logical to-be model can be expanded to show all the physical processes required to implement the logical to-be model.

    Example of making the above logical to-be process model physical:

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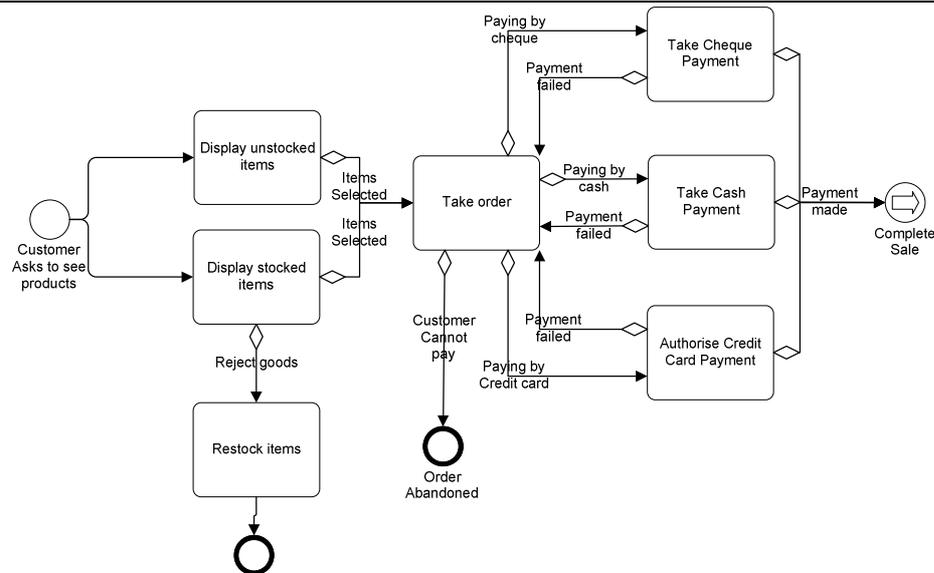
Note that the physical model must mean that decisions have been made about what will be automated and what will not.

- **Implementing the new processes**
  Once the physical to-be process model has been documented as described previously, the analysis is now complete for the processes of the new system. The next stage in the System Development Life Cycle is design. During this stage Systems Analysts or Designers or Systems Architects will propose technical solutions to satisfy the requirements for automation that have been signed-off. The Business Analyst needs to be involved in this stage to
  - o **Add clarity** – explain and expand upon any points that the designers highlight.
 - o **Mediate** – in the case where a technical solution is not feasible (too expensive, technology not capable of performing the requirements and so on), the Business Analyst must define the impact of issue and escalate to those who are empowered to make the decisions required by the issue.
  - o **Protect the requirements** – ensure that design is implementing all the requirements including those documented in the process models and supporting documentation.

In addition, the Business Analyst will need to work with those responsible for operational changes to make sure the new organisation structures are planned for and implemented, appropriate training is designed and delivered to those who need it. Note that the Business Analyst is not responsible for performing these activities, but these activities cannot proceed without input from the process models and Business Analyst.

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Activity	Elements of the process models and documents that facilitate it
System design	• Process Models • Process execution logic • Process data usage • Process non-functional requirements
Organisation redesign	• Process non-functional requirements
Training	• Process Models • Process descriptions • Process execution logic
Procedure design	• Process Models • Process descriptions • Process execution logic • Process data usage

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Further Reading for Syllabus Section 4

Business Analysis – Debra Paul and Donald Yeates
Published by: The British Computer Society
ISBN 1-902505-70-0
Relevant Chapters/sections:
Chapter 4

A Pragmatic Guide to Process Modeling by Jon Holt
Published by: The British Computer Society
ISBN: 978-1-912505-66-4
Relevant Chapters/sections:

Chapter 6

Extracts from the IIBA UK Chapter – BA Recommended Reading List

The Basics of Process Mapping
Robert Damelio, Productivity Inc, 1996
A slim pocket book introducing at a very elementary level notation for process mapping.
Process Mastering
Ray Wilson and Paul Harsin, Productivity Press, 1998
Good focus, method independent, does what it says on the tin.
Process Management
Martyn Ould, BCS, 2006
A good view of modeling and managing processes
Process Change
Paul Harmon, Morgan Kaufman, 2003
Excellent insights and tips into processes, and how they fit into the value chain and organisational models.
Improving Performance, How to Manage the White Space on the Organization Chart
Geary Rummler and Alan Brache, Jossey Bass, 1995
A seminal book on the use of process mapping to understand and diagnose organisational performance.

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Syllabus Section 4 exam style revision question

If you want a review of your answers by a Business Analyst please complete the question and email your answer to MP@smart-BA.com. There is a charge for this service - please pay online at http://www.smart-ba.com/purchase

Scenario
Ultimate Catalogue Company keeps it stock in a huge warehouse with 3 floors. Employees within the warehouse pick, pack and dispatch customer orders to the depots for distribution to individual customers. Customer orders are usually for many items and are received via the Customer Ordering System (COS). The process starts when an employee (known as a 3rd Floor Picker) is available on the 3rd floor. COS prints a picking note for them to go to the warehouse locations on the 3rd floor detailed in the picking note and collate the customer's order in basket carried by the 3rd Floor Picker. When all the items on the 3rd floor for the order have been picked, the basket is hooked on to a conveyor belt that takes it to the 2nd floor. When a 2nd Floor Picker on the 2nd floor becomes available they go to all the locations on the 2nd floor specified on the picking note and pick all the required items for the order. When all the items on the 2nd floor for the order have been picked, the basket is hooked on to a conveyor belt that takes it to the ground floor. When an employee known as a Packer becomes available it is packed ready for shipping to the customer. When the order has been packed the Packer prints off a dispatch note from COS to be included in the customer parcel, as well as an address label for the outside of the parcel. The address label has a code on it telling the Packer which lorry loading bay to take the parcel to. At the loading bay, when a Lorry Driver is available COS is used to print a lorry manifest and the lorry can be loaded by the Lorry Driver with all the parcels on the manifest. Parcels are then taken by lorry to regional distribution centres known as depots for delivery by small delivery vans to customers.

Question 1a.
Draw a physical process model for the warehouse process of picking, packing and dispatching a customer order to the depots.

Question 1b.
Draw a logical process model for the same warehouse process of picking, packing and dispatching a customer order to the depots.

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Syllabus Section 4 exam style revision question   MODEL ANSWER

Question 1a.

Draw a physical process model for the warehouse process of picking, packing and dispatching a customer order to the depots.

Notes:

1. *All the physical details of printing picking, packing and lorry manifest notes are shown as this is a physical model.*
2. *The physical details (where relevant) are included in the process name.*
3. *The process stops with the lorry leaving the warehouse – even though the scenario goes further the question asks for the warehouse processes. Make sure you only answer what the question asks for: any extra processes are ignored and you have just been wasting your exam time.*

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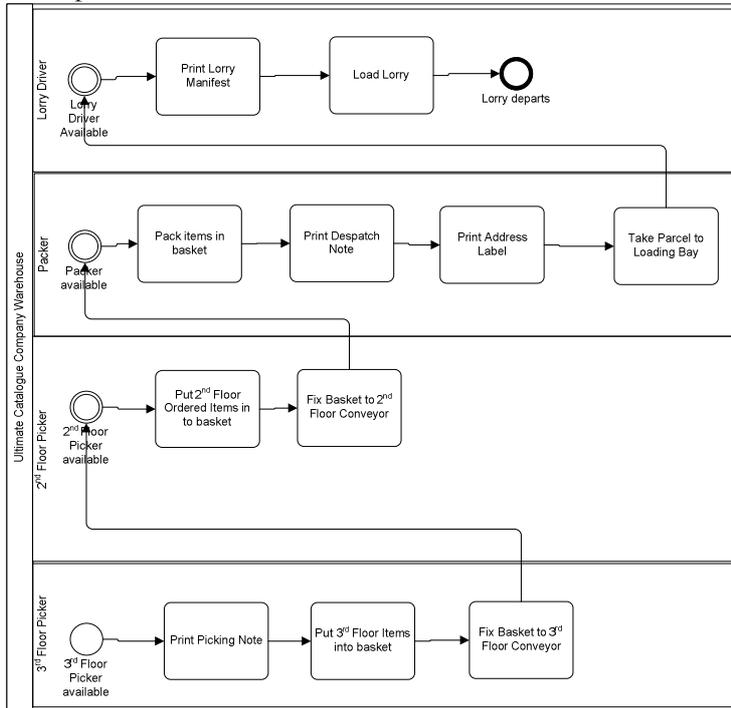distance learning programme
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Question 1b.
Draw a logical process model for the same warehouse process of picking, packing and dispatching a customer order to the depots.
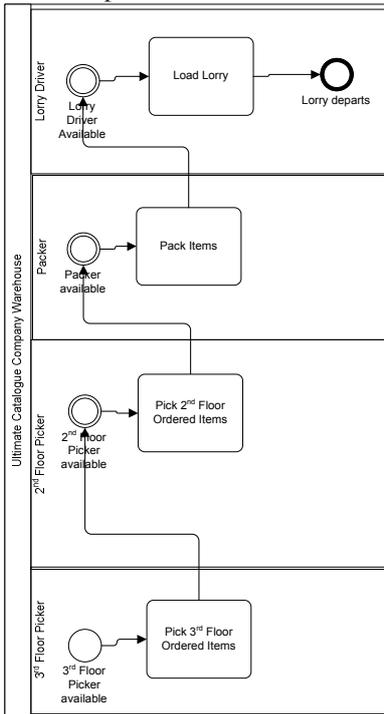

Notes:

1. The 'logicalisation' of the process has been to strip out the physicality of the process in terms of activities and names. Example: Print Picking Note is a physical process that is only required in order to pick items. The logical essence of what the process is trying to achieve is not the printing of the picking note but the picking of the items: the picking note is a means to an end, not a business goal in it's own right.

2. This process could have been 'logicalised' even further: the first 2 processes could have been combined to 'Pick Customer Items'. This <u>function</u> could then have been in the swimlanes of 3rd Floor Picker and 2nd Floor Picker. What it would mean is that exactly the same logical process is performed on the 3rd and 2nd floors by the pickers. This opens up options when it comes to design about how to notify the Pickers of the items to pick.

3. The overall process flow between swimlanes is the same (3rd Floor Pickers do something followed by 2nd Floor Pickers, followed by Packers followed by Lorry Drivers) as we are not redesigning the process at this point, just 'logicalising' it.

Syllabus Section 5: Relationships between business process requirements to system requirement specification

Key points:

- Extent of IT support for the processes
  - Defining 'appropriate' IT systems based on what the project objectives, scope and functional requirements are as defined in the process models.
- Scoping the IT development effort
  - Keeping to project scope.
  - Expanding the scope based on additional elements required *because* of IT systems support for the project scope.
- Documenting IT system requirements.
  - Who should do this? It depends…but the Business Analyst *must* be involved.
  - Having expanded the scope because of IT systems support, the requirements that come from the increased scope need to be defined.
- Integration of process modeling, Modeling Processes and systems development
  - There is a 'driver' linkage between requirements, process models and systems development and this diagram gives the main conceptual links:
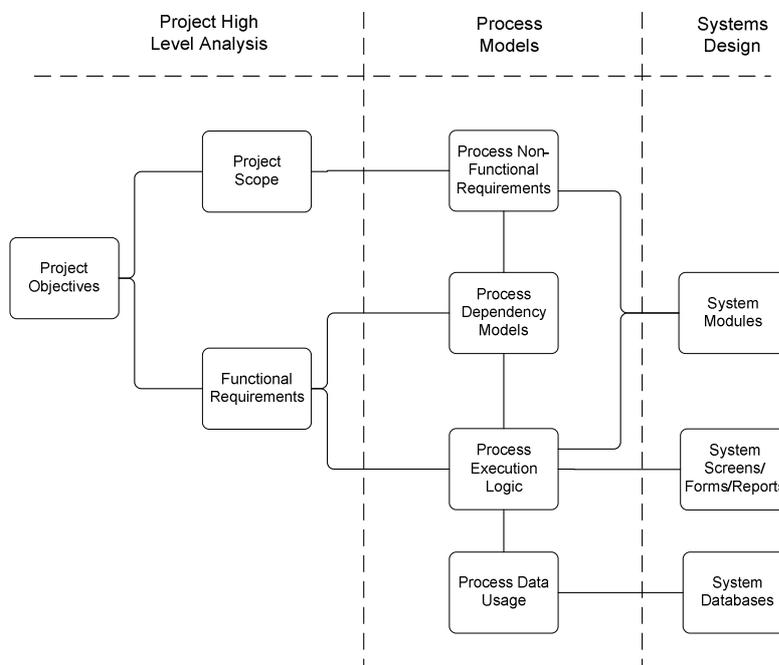
- Related issues:
  - Organisational design
    - Business Analysts don't do it but must inform the process based on the products of their analysis
  - Procedure design
    - Procedures are instructions at individual transaction level for operating a process for a given scenario.
    - Business Analysts don't do it but must inform the process based on the products of their analysis.
  - Skills profiling and training
    - Business Analysts don't do it but must inform the process based on the products of their analysis
  - Managing change
    - At any stage in a project a change can be requested. There can be all kinds of impacts from any one change and the Business Analyst can define the impact on the process models.
    - Once (if) agreement is achieved to make the change, the Business Analyst must update the impacted analysis products including process models.

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Detail:

- **Extent of IT support for the processes**
    - o **Defining 'appropriate' IT systems based on what the project objectives, scope and functional requirements are as defined in the process models.**
      Recall that processes may be
        - ▪ fully manual
        - ▪ partially automated with some user input
        - ▪ fully automated with no user input.
      However, some existing processes may be inadequately automated. A fully manual process perhaps could be automated to an extent but bear in mind that just because some process *can* be automated does not mean it *must* be automated. As always, the decision about whether to automate or not must be taken by considering which level automation best achieves project objectives.
    - o **Processes that need IT automation and don't have it**
      A project has an objective to increase sales per advisor by 10%. Suppose the as-is physical process description for the process "Take Order" states
      "…the advisor checks to see if the customer is already set up as customer by requesting the customer's name, address, and date of last order from the customer.
      The advisor searches for the customer's last order in the box file of orders and – if found – uses the customer number to write a new order…a copy of which is then filed in the box file of orders".
      Bearing in mind the project objective, it would seem reasonable to suggest that
        - ▪ the time spent taking the order is minimised by automating as far as possible "Take Order"
        - ▪ the time spent searching for the customer number is minimised and is a good candidate for automation.
    - o **Processes that don't have sufficient IT automation**
      A project has an objective to increase sales per advisor by 10%. Suppose the as-is physical process description for the process "Take Order" states
      "…the advisor checks to see if the customer is already set up as customer by requesting the customer's name, address, and date of last order from the customer.
      The advisor searches for the customer's last order in the box file of orders and – if found – uses the customer number to generate a new order on the system…a copy of which is then filed in the box file of orders".
      Although the ordering is partially automated, and bearing in mind the project objective, it would seem reasonable to suggest that the time spent searching for the customer number is minimised and is a good candidate for automation.
    - o **Processes that have IT automation and don't need it**
      A project has an objective to increase sales per advisor by 10%. Suppose the as-is physical process description for the process "Take Order" states
      "…having recorded the order, the sales advisor prints a picture of the product the customer ordered and the system emails the picture to the customer as well".
      While being feasible and a value-added service for the customer, this automation (printing and emailing) cost time and money to develop and yet does not contribute to the stated project objective, so all the time and effort involved in developing the functionality will not contribute to the success of the project, but could jeopardise the efforts of the project to complete (i.e. achieve objectives) on time and to budget.
- **Scoping the IT development effort**
    - o **Keeping to project scope.**
      The first stage is to use the process models to scope in terms of IT development
        - ▪ what processes and/or parts of processes will be automated
        - ▪ what screens and reports will be required
      The Business Analyst is not a designer, but they should be a part of this process to
        - ▪ clarify requirements where needed
        - ▪ ensure all process requirements are designed in to the solution somewhere somehow in ways that contribute to project objectives.
    - o **Expanding the scope based on additional elements required *because* of IT systems support for the project scope.**

Once decisions have been made about which processes/tasks (or parts thereof) to be automated, and what screens and reports are to be provided, these may *cause* more requirements that are related to the fact that systems are being developed to deliver project objectives:

Decisions taken to develop IT systems support for Business Requirements	Examples of IT requirements area arising from these decisions
Process automation	- IT help & support for end-users for the new processes - Technical requirements to support process performance requirements - Database requirements to store data needed in order for processes to be able to operate - Security enforcement requirements (e.g. maintenance of user passwords) "Housekeeping" processes to maintain system integrity (e.g. delete abandoned transactions)
Screens	- IT help & support for end-users for the new screens - Technical requirements to support health & safety standards and procedures for data entry - Security enforcement requirements (e.g. only allowing certain levels of users to update certain fields)
Reports	- IT help & support for end-users for the new reports - Technical requirements to support report performance requirements - Database requirements to store data needed in order for reports to be run (e.g. derived data such as total sales per advisor) - Security enforcement requirements (e.g. ensuring that only certain users can request certain reports) "Housekeeping" processes to maintain system performance (e.g. deleting old report data)

- **Documenting IT system requirements.**
  - **Who should do this? It depends…but the Business Analyst *must* be involved.**
    For all additional IT system requirements, the Business Analyst needs to validate that project requirements and objectives are not being compromised. The Business Analyst is – after all – the subject matter expert on project objectives and requirements by the time design starts.
    Example: a project has an objective to reduce administration effort for making sales. A functional requirement is to be able to record sales. A non-functional security requirement for the process "Record Sale" is to ensure that sales are only recorded by sales advisors. A decision is taken to partially automate the process (to reduce admin effort) but this results in a screen design for "Record Sales" where the sales advisor has to supply their login id and password for every sale that they make. Has this "reduced administration effort" or increased it?
    Is the Business Analyst an appropriate role to document the IT system requirements? No, because the Business Analyst *role* is to analyse requirements for changes to businesses. Having said that, if the *person* who performs the Business Analyst *role* also performs a designer *role*, then that *person* might document the IT systems requirements as well.
  - **Having expanded the scope because of IT systems support, the requirements that come from the increased scope need to be defined.**
    There are various ways to document these types of requirements:
    - As pseudo-code in the process execution logic

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- As technical specifications
- As functional specifications

Again, it is not the *role* of the Business Analyst to do the documentation, but they should review it in order to validate that requirements and objectives are not being compromised in any way.

- **Integration of process modeling, Modeling Processes and systems development**
  - o **There is a 'driver' linkage between requirements, process models and systems development and this diagram gives the main conceptual links:**
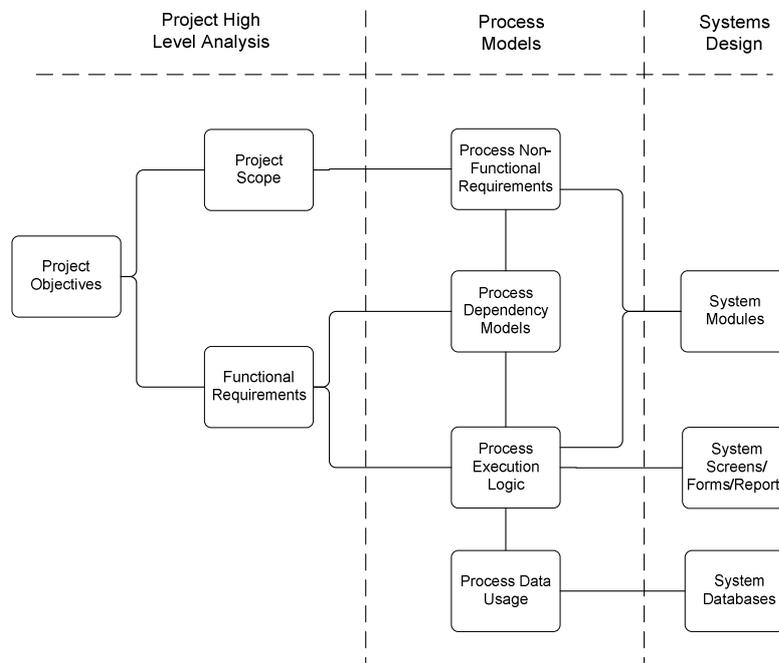
This diagram is not a strict mapping of linkages, but shows the main conceptual links between the various components in terms of what components 'drive' the production of subsequent components:

- The Functional Requirements are the functionality that is required in order to achieve Project Objectives. Example: the objective "Increase Sales Per Advisor by 10%" means the functional requirement "Be able to record sales" is *required*.
- The Project Scope is how big the impact of the project needs to be in order to achieve Project Objectives. Example: Unless the project changes the way that all sales advisors take sales, the average sales per advisor can not be increased by 10%.
- Every Functional Requirement (which is the ability to be able to do something – and "doing something" is a process) will have at least one process that delivers that Functional Requirement. Some Functional Requirements will be fully or partially expressed in Process Models and some in Process Execution Logic. Example: The functional requirement "Be able to record sales" is delivered via the process "Record Sale".
- Every process on a Process Model will have (at the atomic level at least) Process Execution Logic. Example: To "Record Sale" (process) the sales advisor must identify the customer and the product they are buying, the agreed sales price…etc (process execution logic).
- Process Execution Logic will specify how the process manipulates data (because that is what processes do: manipulate data) giving the Process Data Usage. Example: the process execution logic for "Record Sale" will need data about customers, products and sales prices in order to be able to execute.
- Project Scope will be implemented by the Process Non-Functional Requirements. Example: The process "Record Sale" has a non-functional requirement to be available to the role Sales Advisor (from the Project Scope).
- Every process on a Process Model will have (at the atomic level at least) Process Non Functional Requirements. Example: The process "Record Sale" has a non-functional requirement to be available to the role Sales Advisor.

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- System Modules can be derived from the information contained in the Process Execution Logic and Process Non Functional Requirements when decisions about what processes to automate and how much are made. Example: a module to execute logic to be automated for the "Record Sale" process.
- Systems screens/forms/reports can be designed from the Process Execution Logic. Example: A screen that allows a Sales Advisor to perform the Process Execution Logic required by "Record Sale" – i.e. input data to allow the system to find the customer and product, and allow the user to record the sale price.
- Systems databases as a minimum must cover the data required by processes as defined in Process Data Usage. Example: The data that allows the modules to search for customers and products, a somewhere to store the agreed sales price.

  Note: as discussed in the previous section requirements for further system modules, screens, forms, reports and databases may be generated from the decisions made about what to automate.

- **Related issues:**
  - **Organisational design**
    - **Business Analysts don't do it but must inform the process based on the products of their analysis**
      Process re-design can impact the total manual effort required to run them. It is often a project objective to reduce effort required to run processes and this translates directly to the staff that are now required. How can this impact be assessed?
      In the as-is process model, metrics concerned with the number of transactions and time taken to process can be measured. Straight-forward measurements of the number of staff running processes can also be recorded.
      The same metrics can be measured (more likely estimated) for the to-be process. The gap between the two sets of values is the impact.
      Note that these metrics are either classified as
      - process metrics if they – in effect – defining whether the process is running successfully or not
      - non-functional requirements where they are not – in effect – defining whether the process is running successfully or not, they just measure what the process is consuming or producing.
  - **Organisation structure implications**
      It is not unusual for a project to result in changes to organisation structure and this can be for a combination of reasons:
      - The numbers of staff required to operate the processes changes so the number of managers and support staff change. The metrics collected for processes will inform this redesign.
      - New or changed processes need new or changed Organisation Structures.
  - **Procedure design**
    - **Procedures are instructions at individual transaction level for operating a process for a given scenario.**
      Example: there may be a procedure for make a sale to an existing customer for a high value item and another procedure for make a sale to a new customer for a low value item. In both procedures, the process "Record Sale" is used but the procedure for operating the process is different.
    - **Business Analysts don't do it but must inform the process based on the products of their analysis.**
      The to-be process execution logic can be used to define the precise procedure in each case. The Business Analyst can instruct the procedure writers about the fine detail of the process execution logic and validate that the procedures are using the process in the best way to meet project objectives.
  - **Skills profiling and training**
    - **Business Analysts don't do it but must inform the process based on the products of their analysis**

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- New organisation structures may be required to reflect the new roles that have been created as a result of the process changes. For example, there may be a new small team of subject matter experts in the day to day operation of the processes who are also responsible for operational fine tuning of process operations. The new processes that this team operate themselves can inform this design, as well as the number and complexity of the processes that they support.

- The work that the staff are required to do in operating the processes changes – perhaps before the project they credit checked customers and after the project, this has been automated. The process specifications can be used to inform the staff role and skillset redesign.

o **Managing change**
  ▪ **At any stage in a project a change can be requested. There can be all kinds of impacts from any one change and the Business Analyst can define the impact on the process models.**
    As shown previously, there are conceptual links between Project Objectives, Project Scope, Functional Requirements, Process Models and IT Systems designs. It follows from this that if a change is proposed, the links can be followed to define the maximum potential impact of the change. Each potential impact will have to be assessed by the Business Analyst to ascertain if there will be a material impact (a material impact is an impact that means some work will have to done to accommodate the change). The Business Analyst can define what would need to be done in order to accommodate the change bearing in mind that a change can create subsequent 'knock-on' effects.
    Example: If a change is proposed whereby during the process "Take Order" the customer email is to be recorded, the Business Analyst can ask "what functional requirement does this contribute to?". Assuming a satisfactory answer, the Business Analyst knows that there will be a change required to the Process Execution Logic for the "Take Order" and the Process Data Usage, but not (perhaps) to the Process Model and almost certainly not to the Process Non functional Requirements.

  ▪ **Once (if) agreement is achieved to make the change, the Business Analyst must update the impacted analysis products including process models.**
    If the change is agreed then the impacted analysis products must be updated to be kept in line with have now become the current signed off requirements. This may result in changes to the systems design.

Further Reading for Syllabus Section 5

Business Analysis – Debra Paul and Donald Yeates
Published by: The British Computer Society
ISBN 1-902505-70-0
Relevant Chapters/sections:
Chapter 10.

Extracts from the IIBA UK Chapter – BA Recommended Reading List

The Basics of Process Mapping
Robert Damelio, Productivity Inc, 1996
A slim pocket book introducing at a very elementary level notation for process mapping.
Process Mastering
Ray Wilson and Paul Harsin, Productivity Press, 1998
Good focus, method independent, does what it says on the tin.
Process Management
Martyn Ould, BCS, 2006
A good view of modeling and managing processes
Process Change
Paul Harmon, Morgan Kaufman, 2003
Excellent insights and tips into processes, and how they fit into the value chain and organisational models.
Improving Performance, How to Manage the White Space on the Organization Chart
Geary Rummler and Alan Brache, Jossey Bass, 1995
A seminal book on the use of process mapping to understand and diagnose organisational performance.

Syllabus Section 5 exam style revision question

Scenario:

Obscure Book Collector (OBC) is a small chain of 15 shops specialising in the supply of old and obscure books. These books tend to be expensive collectors' items so the volume of transactions is low – around 10 sales per day per shop. Each shop has 2 assistants and a manager to provide a very customer focused service.

Typically, the customer enters the shop and can browse for what they want or – more often – request it from an assistant. The assistant or manager will search for editions they hold of the desired title both in the shop's stockroom and the other shops' stock via an internet based stock enquiry system. Having displayed the stock held in the shop or by the chain of shops, the customer can select which books they are interested in. The OBC employee finds the customer record by searching existing customer records for matching name and address details held in a customer database also accessible via the internet. New customers are registered by the assistant or manager completing a registration form with the customer. In the interests of customer focused service, this process needs to be as quick as possible to get the customer to the purchasing stage with the minimum of delay so the customer details are not loaded to the database until after the customer has left.

It is not uncommon for duplicate customers to be created due to different OBC employees across the chain of OBC shops spelling the customer name or address differently and so failing to find an existing customer. This is an issue for OBC in understanding it's customer base and when doing marketing mail-shots and other promotions. Having found or created the customer, payment is taken by cash or credit card using immediate payment validation via a credit card machine.

After the customer has gone, if items were sold from the stock held at the shop, the assistant needs to update the stock enquiry system with the sale. If items are sold from stock held at other shops a paper order is created and faxed to the relevant shop(s).

It is not uncommon for the shop receiving the faxed order to respond that the item has already been sold. This causes considerable customer inconvenience and disappointment, as well as significant work for the OBC employee who placed the order to refund the customer and update records of sales. Given that OBC needs to build and maintain excellent customer relationships because of the nature of the business, this is a major issue for OBC.

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Question 1a.

OBC has initiated a project which has an objective of reducing the number of orders that have to be cancelled because the items are held in other shops and have already been sold.

An analyst has suggested a number of changes to the existing process.

Review these suggestions and comment on how appropriate they are for the project.

Suggestion	Review
Automate customer registration. This will speed up the process and help reduce duplicate customers.	
When items from other shops are ordered, automate the sending of the order information to reduce manual effort and speed up the order fulfillment.	
When an item is sold by a shop from its stock, automate the update of the stock enquiry system to make the records of current stock held by shops more accurate.	

Question 1b.

For any one suggestion in Question 1b suggest an IT requirements that might need to be generated.

If you want a review of your answers by a Business Analyst please complete the question and email your answer to MP@smart-BA.com. There is a charge for this service - please pay online at http://www.smart-ba.com/purchase

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Syllabus Section 5 exam style revision question   MODEL ANSWER

Question 1a.

OBC has initiated a project which has an objective of reducing the number of orders that have to be cancelled because the items are held in other shops and have already been sold.

An analyst has suggested automating some of the existing process.

Review these suggestions and comment on how appropriate they are for the project.

Suggestion	Review
Automate customer registration. This will speed up the process and help reduce duplicate customers.	Out of scope: speed of registration is important to OBC but is not in the scope of the project which is focused on reducing cancelled orders.
When items from other shops are ordered, automate the sending of the order information to reduce manual effort and speed up the order fulfillment.	Out of scope: the scenario does not mention any issues connected with manual effort or speeding up order fulfillment.
When an item is sold by a shop from its stock, automate the update of the stock enquiry system to make the records of current stock held by shops more accurate.	Fine. This will contribute to the project objective of reducing the number of orders that have to be cancelled because the items are held in other shops and have already been sold by making the stock enquiry system more accurate.

Question 1b.

For any one suggestion in Question 1b suggest a type of IT requirement that might need to be generated.

Suggestion	Example types of IT Requirement
Automate customer registration. This will speed up the process and help reduce duplicate customers.	-Technical requirements to support health & safety standards and procedures for data entry. -Database requirements to store data needed in order for processes to be able to operate
When items from other shops are ordered, automate the sending of the order information to reduce manual effort and speed up the order fulfillment.	-Security enforcement requirements (e.g. only allowing certain levels of users to update certain fields) -Database requirements to store data needed in order for processes to be able to operate
When an item is sold by a shop from its stock, automate the update of the stock enquiry system to make the records of current stock held by shops more accurate.	-"Housekeeping" processes to maintain system integrity (e.g. delete abandoned transactions) -Technical requirements to support process performance requirements

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Maximise your marks in a Modeling Processes exam

Key points:

This is the sort of exam you are likely to face:

1. Exam format – Open book, 15 minutes reading time, 1 hour writing time
2. Reading time – take in this manual! Take in small post-its to mark relevant pages. Plan what order to answer questions
3. Writing time – read each question in your preferred order and then answer the question, the whole question and nothing but the question, and refer all answers to the scenario – the exam is testing your ability to *do* Modeling Processes!

Detail:

1. **Exam format – Open book, 15 minutes reading time, 1 hour writing time**
   - The room will be laid out exam style: 1 person per desk, all desks face forward, clock clearly visible.
   - Your exam pack will consist of:
     i. An exam cover sheet
     ii. An exam paper
        - Scenario outlining the context for the analysis you will be asked to do in the exam
        - Around 4 to 8 questions asking you to do Modeling Processes on the scenario
     iii. Several sheets of A4 for writing your answers on
   - You will be asked to complete the exam front sheets and you should write your name on all the A4 answer sheets as well.
   - No talking from here on in unless you need help from the invigilator such as more paper.
   - Then you get 15 minutes to read the exam paper.
   - Then you get 1 hour to answer the exam questions.
   - Materials:
     i. You can take any books etc you like in to the exam but not a laptop or mobile phone.
     ii. Take a couple of black ink pens with you (in case one runs out!) and a ruler.
     iii. Take some post it notes so that you can mark relevant pages during the reading time.
     iv. If you have any questions about what is allowed and what is not ask us and/or ask the invigilator on the day.

2. **Reading time – take in this manual! Take in small post-its to mark relevant pages. Plan what order to answer questions.**
   - The reading time is 15 minutes. Read the scenario AND the questions.
   - Reread the scenario.
   - Read the questions again. Note that the breadth of topics covered in Modeling Processes means that you will not have a question on every topic.
   - For each question think if you need to reference any sections of the books you have brought in with you. **DO NOT WRITE ANYTHING DOWN!** You can use the post-its to mark any passages you think might help but you must not write anything down or even pick up your pen!
   - Plan to answer the questions in the following order:
     i. those you are confident you can answer and have high marks
     ii. those you are confident you can answer and have lower marks
     iii. those you are less confident about and have high marks
     iv. those you are less confident about and have lower marks

3. **Writing time – read each question in your preferred order and then answer the question and refer all answers to the scenario – the exam is testing your ability to *do* Modeling Processes!**
   - Answer the questions in your planned order.
   - **Read the question** to make sure you understand it. There are countless examples of candidates who have (for example) drawn an excellent process model but have been awarded no marks for it as it was for the wrong process! Some candidates write the essence of the question out as part of the answer and this seems to help them and the examiner.
   - **Answer the question**. There are no marks for elements of analysis that the question does not call for. If you think the question could be interpreted in multiple ways, state how you have interpreted

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it. If you need to make an assumption to answer the question, state the assumption. The examiners are looking for reasons to give you marks so give them as much evidence as you can that the answer in the context of the scenario, how you have interpreted the question and the assumptions you have made is correct.

- **Remember to answer the question, the whole question and nothing but the question!** If the exam question asks for 5 of something, do not bother doing more than 5: the examiner will mark the first 5 and ignore the rest. If you do not want an examiner to mark an answer, clearly strike it through. Do not add information that is not asked for by the question or needed to justify your answer: you are wasting time.

- **The examiners want you to pass**! They cannot just award or take away marks arbitrarily – there is a definite marking process to follow, extensive marking guidelines and random papers are checked. So the awarding of marks has to be justified by written evidence of the correct answer to the exam questions. Make sure that you give the examiners as much information as you need to in order to show that you can do the analysis the question asks you to do.

- ***Refer to the scenario***! This is a test of your ability to **do** Modeling Processes not quote textbooks – in fact examiners have instructions to mark down answers that do not reference the scenario and explain how – in the context of the scenario – the analysis would be done.

- Write as neatly as you can – there are no marks for neatness but the markers are human and if they can't easily read your answer they are going to struggle to award you marks!

- **Name any processes as verb+noun!**

- Keep an eye on the time – try not to spend more than 10 minutes on any one question.

- If you have any spare time check your answers. You have to stay for the full hour so you might as well use all of it.

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Modeling Processes Sample Exam Paper and Marking Scheme

For an example of this type of exam there is a sample paper and marking scheme from the BCS ISEB website at http://www.bcs.org/upload/pdf/resample.pdf and http://www.bcs.org/upload/pdf/remark.pdf and is downloadable from there.

The following pages are a sample paper for an exam of this type that you should attempt to answer and then review the marking scheme answers that follow it.

This exam is presented for you to check your ability to take an exam – hence it is in your interests to take the exam in conditions which closely mimic the actual exam.

If you want a review of your answers by a Business Analyst please complete the exam paper and email your answer to MP@smart-BA.com. There is a charge for this service - please pay online at http://www.smart-ba.com/purchase

CERTIFICATE

IN

MODELING PROCESSES

EXAM PAPER – SBA/MP/001/v1.0

Time Allowed: 1 hour

- You are allowed fifteen (15) minutes reading time before the examination starts. You are not allowed to write anything during that reading time.
- This is an open-book examination which means that you can refer to written material in addition to the examination paper itself.
- Write in blue or black ink only.
- Please write your name at the top of each piece of paper used for your answers.
- Attempt ALL questions. All questions are based on the same scenario.
- Marks may be deducted for spurious and irrelevant answers.
- State any assumptions made.
- There are 52 marks in total for this paper. The pass mark is 26.
- The mark awarded for each separate question will be shown with the question text.

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Scenario – Senior Exec Travel

Senior Exec Travel provide a specialist travel booking service to companies who need to be able to get their employees to different countries at short notice. They will arrange the transport by land, sea or air for a door-to-door service and manage re-arranging travel plans as and when required. This is a small business employing 8 Travel Advisors in one office with no specific IT systems other than networked PCs standard office applications.

The current process is that clients phone, email, fax or post their travel plan requirements in. When phoned in the requirements are written down by who ever takes the call and put in the New Travel Requirements in-tray where faxes, letters, and printed emails are also deposited in the order they arrive. When a Travel Advisor becomes available they sort through the in tray and pick the most urgent set of travel requirements to work on. They take the requirements out of the in-tray so that no-one else will start working on it as well and that Travel Advisor then has ownership of the travel requirements and is the sole point of contact for dealing with the customer. Subsequent phone call messages, emails, faxes or letters are passed on arrival to the relevant Travel Advisor. All information concerning the travel arrangements for the customer is held in a paper file maintained by the Travel Advisor dealing with it.

Customers frequently need to change their travel arrangements and when a flight is involved they must request this with written (email, fax or letter) instructions to change the flight. These instructions are passed to the relevant Travel Advisor when they are available. The Travel Advisor attempts to make the changes to the existing flight. Where this is not possible because of the terms and conditions of the booking, they email the customer that a new flight will have to be booked and that the customer is still liable for the original flight. If the customer accepts this they must reply by email stating that by the end of the business day in which case the Travel Advisor books another flight and prints the amended or new tickets to be sent by courier to the customer. If the customer rejects it or the end of the business day is reached the request is abandoned. If the customer still requires the change they must resubmit it the next working day.

Senior Exec Travel management is aware of a number of issues with all the current processes: There have been several instances where travel arrangements have gone wrong because the Travel Advisor has not been available when the customer made an enquiry about existing arrangements or needed to re-arrange their travel. In addition, Travel Advisors complain that it is very difficult to keep track of where they are up to with each customer's booking resulting in (at best) wasted time finding out and (at worst) forgetting to do some tasks.

A project has been initiated with the objective of reducing the number of travel arrangements that go wrong.

End of Scenario

Question 1

With specific reference to the scenario, outline how modeling the current logical processes could help the project achieve its objectives.
6 marks

Question 2

Draw a **logical** process model in the format of your choice for the **current** process operated by Travel Advisors for re-arranging a flight from the point that the Travel Advisor receives the written instructions to change the flight. You do not need to show interaction with any externals such as customers.
22 marks

Question 3
From your logical model from Question 2 outline for **one** process how you would expect the development of an IT system to help Senior Exec Travel achieve their objective.
4 marks

Question 4

A Business Analyst has drawn the following process model for the **to-be logical high level** process to receive and allocate New Travel Requirements. Identify problems with the model and make any relevant suggestions to improve it.
10 marks

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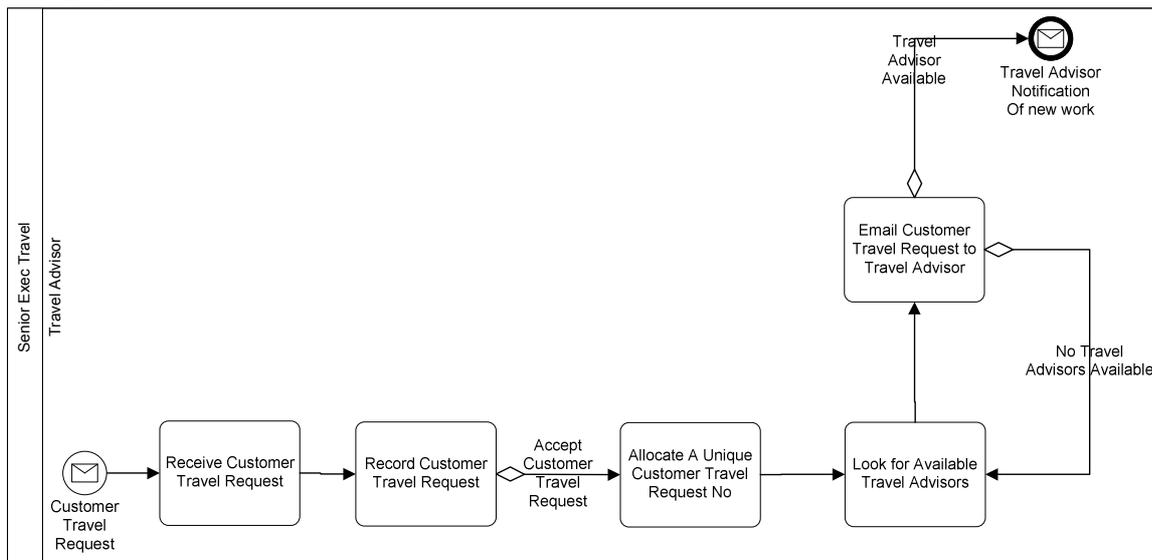
Question 5

What current business rule has been changed by the Business Analyst's process model in question 5?
What staffing issues do you think it might raise?
4 marks

Question 6

From the scenario description of all Senior Exec Travel processes, identify 3 stakeholders who currently interact with the overall process and define their **primary** role as a

- *beneficiary* of the process
- *operator* of the process
- *provider* of information or services or data to the process

6 marks

Total Marks Available = 52
Pass Mark = 26

End of Paper

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Marking Scheme

Question 1

With specific reference to the scenario, outline how modeling the business current logical processes could help the project achieve its objectives.
6 marks

Marking guidelines:

Candidate answers must make explicit reference to the scenario.

Valid reasons include:

The objective is to reduce the number of travel arrangements that go wrong and the reasons why they go wrong are
- Travel Advisors not being available
- Travel Advisors not being able to find relevant information.

Modeling the current logical processes can help the project achieve the objective by
- enabling Senior Exec Travel to look at all their processes end to end and understand them
- identifying which processes are dependant on certain Travel Advisor's availability
- defining the information that is required to run the travel booking service

1 mark for any valid reasoning or suggestion up to a maximum of 6.

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Question 2

Draw a **logical** process model in the format of your choice for the **current** process operated by Travel Advisors for re-arranging a flight from the point that the Travel Advisor receives the written instructions to change the flight. You do not need to show interaction with any externals such as customers.

22 marks

Marking guidelines:

Example logical model
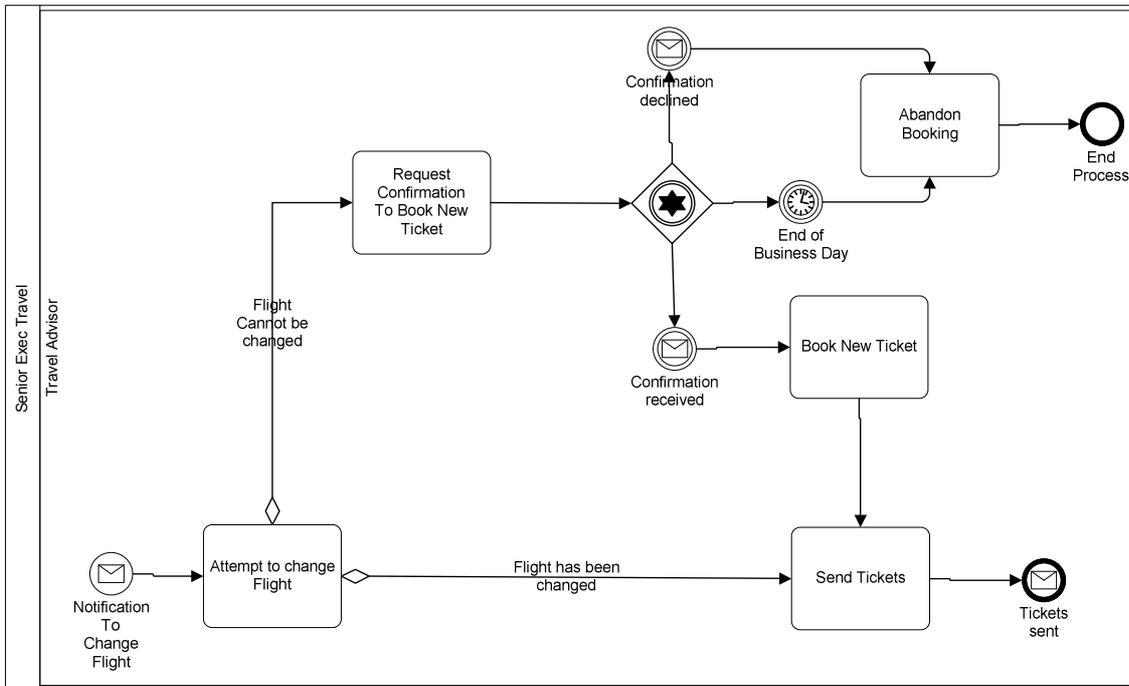
Starting event – 1 mark

Processes – 2 marks per process up to 10 marks

Process dependencies – 1 mark per correct flow between processes/events up to 3 marks

Decision gateways/set of conditional flows – 1 mark per gateway/set up to 2 marks

Event based gateway – 1 mark

Intermediate events – 1 mark per event up to 3

Terminating events – 1 mark per event up to 2 marks

Any other process modeling notation (except DFDs) is acceptable provided that the rules expressed in the above model are also encapsulated in the model.

Any processes not in scope of the question should be ignored.

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Question 3
From your logical model from Question 2 outline for one process how you would expect the development of an IT system to help Senior Exec Travel achieve their objective.
4 marks

Marking guidelines

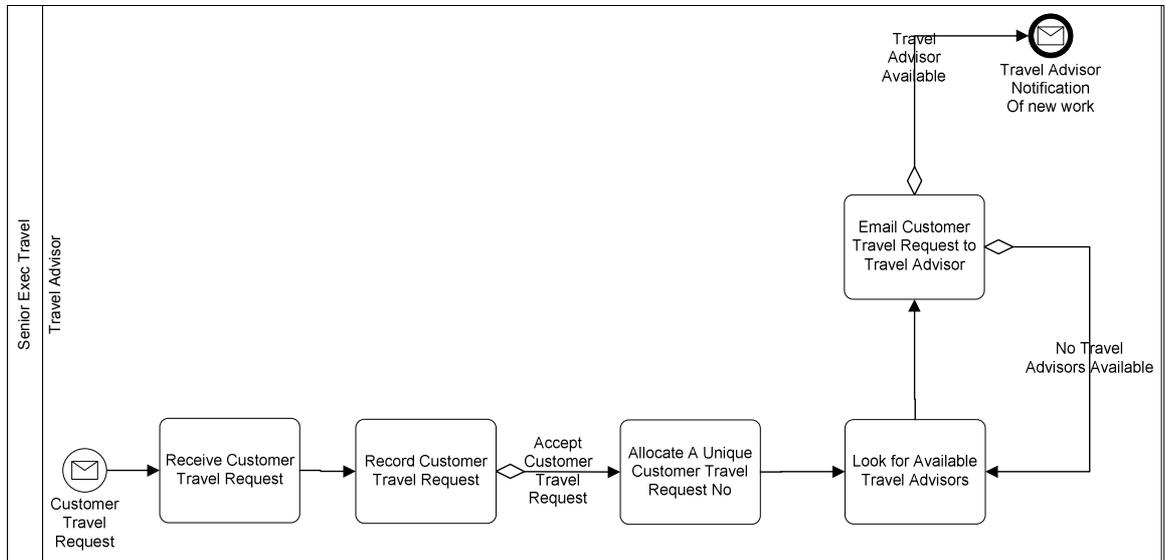Up to 2 marks for each valid suggestion.

If the candidate supplies suggestions for more than one process only mark for the first process the candidate supplies and ignore the rest.

Process	Valid suggestions
Attempt to change flight	To address the issue of advisor unavailability: - Route the incoming message straight to the relevant Travel Advisor. - Allow any Travel Advisor who is available to handle the request to change the flight. To address the issue of Travel Advisors not being able to find relevant information - Hold the flight change request and result on a central database.
Request Confirmation to Book New Ticket	To address the issue of advisor unavailability: - Allow any Travel Advisor who is available to make the request. To address the issue of Travel Advisors not being able to find relevant information - Hold the request confirmation communication and result on a central database.
Abandon Booking	To address the issue of advisor unavailability: - Allow any Travel Advisor who is available to abandon the new booking. To address the issue of Travel Advisors not being able to find relevant information - Hold record of abandonment on a central database.
Book New Tickets	To address the issue of advisor unavailability: - Allow any Travel Advisor who is available to book the new tickets To address the issue of Travel Advisors not being able to find relevant information - Hold the new ticket booking on a central database.
Send Tickets	To address the issue of advisor unavailability: - Allow any Travel Advisor who is available to send the tickets To address the issue of Travel Advisors not being able to find relevant information - Hold the record of dispatch on a central database.

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Question 4

A Business Analyst has drawn the following process model for the **to-be logical high level** process to receive and allocate New Travel Requirements. Identify problems with the model and make any relevant suggestions to improve it.

10 marks

Marking guidelines

Up to 2 marks for each valid problem or suggestion identified up to a max of 10 marks.

Examples of problems and suggestions with the process model:

- What is the difference between "Receive Customer Travel Request" and "Record Customer Travel Request"? Possibly combine these processes
- If a Customer Travel Request is not accepted, what happens? Appears to be a dead end at "Record Customer Travel Request" when the request is not accepted.
- "Allocate A Unique Customer Travel Request No" does not appear to be high level.
- There could be an infinite loop between "Look for Available Travel Advisors" and "Email Customer Travel Request to Travel Advisor" when there is no Travel Advisor available.
- "Email Customer Travel Request to Travel Advisor" is physical, not logical.
- Combine "Look for Available Travel Advisors" and "Email Customer Travel Request to Travel Advisor"

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Question 5

What current business rule has been changed by the Business Analyst's process model in question 5?
What staffing issues do you think it might raise?
4 marks

Marking guidelines

2 marks for identifying that the rule that is challenged is that only one Travel Advisor is the sole point of contact for a customer's travel arrangements.

1 mark per valid suggestion of staffing implications up to max of 2 marks.

Examples of potential staffing issues:
-   Travel Advisors may resist change because they have 'special relationships' with their customers.
-   Travel Advisors may resist change as they may see it as de-skilling their role.
-   The total number of Travel Advisors required may reduce if any Travel Advisor can deal with any customer.
-   An overall manager

Question 6

From the scenario description of all Senior Exec Travel processes, identify 3 stakeholders who currently interact with the overall process and define their **primary** role as a
-   *beneficiary* of the process
-   *operator* of the process
-   *provider* of information or services or data to the process

Marking guidelines

2 marks for each valid combination:

Stakeholder	Primary Role
Customer	Beneficiary
Travel Advisor	Operator
Courier	Provider

6 marks
Total Marks Available = 52
Pass Mark = 26

End of Paper

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Glossary of terms

B Beneficiary – a *stakeholder* that receives goods and/or services from a process
Business Requirement – a change (system and/or business) required to deliver *objectives*
BPMN – Process Modeling Notation

C CARE – Computer Aided Modeling Processes
CASE – Computer Aided Software Engineering

D Data Requirement – a change to the information required in order to for *processes* or *tasks* to be able to run.

E External - An external is a person, role, organisation or IT system that is external to the scope of the project (i.e. will not be changed by the project) that the solution the project develops will interact with.

F Functions are common sub-processes or tasks that
   - are used by more than one process
   - typically accomplish one significant outcome in terms of either data or directing process flow

Functional Requirement – a system change required to deliver *objectives*.

G General Requirement – a requirement that sums up the scope of the project from a requirements perspective

N Non-functional requirement – a change required to deliver *objectives* that is not a *General, Business, Functional, Data or Technical Requirement*

O Objectives are measures that can increased, decreased or maintained and if they hit a certain target value equate to project success. For this reason they are the project benefits.
Operator – a *stakeholder* that executes a *process*

P PID – Project Initiation Document
PIR – Post Implementation Review
Process – a connected series of business activities (at the lowest level these are *tasks*) designed to produce a meaningful outcome for the business
Process Metrics – measures and target values that define whether the process is running optimally or not – they define if the project is successful. Process Metrics can be thought of as process objectives or goals.
Provider – a *stakeholder* that supplies goods and/or services and/or data to a *process*

Q

R Requirements are defined as those things which need to change in order for the system to deliver the *objectives*.

S SDLC – Systems Development Life Cycle
Stakeholder – someone or organisation unit that is impacted by the process

T Task – the lowest level of decomposed *process*
TOR – Terms of Reference
Technical Requirement – a constraint imposed on the project in terms of what options are available to design the solution

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Your notes

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