BUSINESS PROCESS MODELLING
Primer
Version 0.2

1 Purpose & Scope

The following pages describe the beginning of "Business Process Modelling". The first step is a simple gathering of information into one or more word documents.

Section 2 raises the question 'which business processes?' and puts forward some ideas about the different areas that may need to be tackled.

Section 3 provides a template which gives a word-picture of the information that we need to capture about a business process. Note that an empty template is provided in the appendix for modellers to copy and use as the master.

Section 4 emphasises that the next stage is a process of 'fleshing out' the initial overall word-picture shown in Section 2, creating more detail. In the process, the pieces of information required or created by the process are identified.

Example 1 is an example of a business process in a trade environment. It is taken from the book "UML Distilled Second Edition".

Example 2 is an example of a business process in the finance area. It is a draft, it may contain inaccuracies or be incomplete, but it is a starting point for real work in the Finance BPM Task Force.

2   Decision Time

To choose the business processes to model, for example in raising and handling a transaction such as an order, one needs to think about the range of ways in which the transaction can be initiated by the originator. One also needs to think about how the recipient involved will handle the transaction, what the originator needs back in response, and how the originator connects this back into their systems.

Each one of these ways can be seen as a complete business process, and the modelling activity requires originator and recipient knowledge. Originators may be able to express their view of what the recipients do, and vice versa, but it is even more important to have input from both sides into the modelling activity.

For example, in the Finance - Payments area, one needs to think about the range of ways in which a payment order/credit transfer is initiated by a bank customer, handled by the bank, and then how the customers involved handle the bank response/advice. A list of candidate business processes may include:-
- Ordering Payment against an invoice(s)
- Ordering Payroll payments
- Ordering Dividend payments
- Ordering Interest payments

There may be more, different, processes that lead up to ordering the payment to be made.

It is suggested (see section 4) that the business area commissioning a Business Process Modelling task-force should establish such a list of candidate business processes, and then select one for the first modelling exercise. Others can be derived by simplifying or extending the first model; some will fit the first or later models.

At this very early stage in the modelling process, one should be looking for different business processes which may need, for example:-
- a change to the specifications for the information content within the chosen transaction
- a change to the structural arrangement of the information content within the transaction
- coupled transactions where one must be executed prior to another

One may find that some business processes, once they have been detailed, actually follow the same pattern as another business process. This is good! But a review and amalgamation of the scope of each into one which applies equally to both is essential.

There may only be subtle differences between the detailing of one business process and another. Every attempt should be made to bring these together into a single sensible business process. The aim is to have a minimum number of simple business processes, but a sufficient set to be comprehensive.

3 Template

3.1 Business Process Name

This is the name of the Business Process which is being documented.
How one chooses the business process has been described in Section 2.

Example: (from example 1)
Buy a Product

3.2 Description of the Business Process

This should be a relatively concise description of the process to be detailed. It should be a description which is sufficient to outline the scope of activity that the business process includes. It may need to identify things which are not included.
At a later stage, when examining other business processes which use the same pattern of business process model, it may be necessary to re-visit the description and enhance it.

Example:
The customer browses the catalogue and adds desired items to the shopping basket. When the customer wishes to pay, the customer describes the shipping and credit information and confirms the sale. The system checks the authorisation on the credit card and confirms the sale both immediately and with a follow-up e-mail. The credit card authorisation might fail, and the customer is allowed to re-try.

3.3 Actors

This is a list of the actor roles which must be played in the business process. It is not sufficent to say just bank and customer. One must name, for example in a financial transaction, the Ordering Party, Beneficiary, Beneficiary's bank and so on.
Each of these actor roles must be defined, and compared with business area glossary if such exists.

Example:
Customer, System

3.4 Pre-condition

These are essential conditions which must be fulfilled before the business process can start. These will be the result of prior business processes that are considered separate processes and hence are not included within the one that is being detailed. For example, opening an account may be considered a separate process from ordering a payment, but handling the situation when there is not enough money in the account is part of ordering a payment. Seen from the viewpoint of the initiator of the process, these are the answers to the question "What must I have done before I start?"

Example:
A catalog of items has been made available to customers

3.5 Post-condition

These are the conditions that the initiator, and other actors involved, expect to have happened as a result of the business process.

Example:
The customer wishes to have placed an order for product(s) and to have received confirmation. The System holds a confirmed order that it can fulfil.

3.6 First Level of Detail

The business process should be broken down into a series of main steps. It should be a complete breakdown, but at a reasonably high level, for example like section headings in a chapter of a technical book

Name of Business Process

Example:

> Buy a Product

Main Steps of the Business Process
The breakdown of the business process into a series of main steps, taken from the description, and listed in the sequence in which they occur.

1 1st main step in the business process
2 2nd main step in the business process
3 etc

Example:

> 1. Customer browses through catalog and selects items to buy
> 2. Customer goes to check out
> 3. Customer fills in shipping information (e.g. address, whether next-day or 3-day delivery)
> 4. System presents full pricing information, including shipping
> 5. Customer fills in credit card information
> 6. System authorises purchase
> 7. System confirms sale immediately
> 8. System sends confirming e-mail to customer.

Alternatives
There may be one or more alternative routes through the main steps that are taken in certain conditions. Each needs to be noted. Again, keep this at a reasonably high overview level. There may be alternatives within an individual main step, and these will be teased out later.

Alternative 1

A brief and succinct description of the circumstance in which the alternative route is taken

Example:

> Authorisation failure. The system will fail to authorise the credit purchase if the credit card authorisation might fail, and the customer is allowed to re-try.

Step at which alternative is taken

The main step at which the decision to take the alternative is made.

Example:

> At step 6, system fails to authorise credit purchase

Alternative steps
The main steps in the business process that are taken as a result of the decision to take the alternative route. Nnumbering the steps can be used if desired for clarity. They should be steps at about the same level of detailing as all the main steps. There may only be one.

1 1st alternative step in the business process
2 etc

Example:

> 1. Allow customer to re-enter credit card information and re-try

Main step after alternative

The next main step that is taken after the alternative route (i.e. where one comes back into the normal business process.), if there is one. It may be the end of the process.
Note that this may involve going back to an earlier main step in the normal business process, or it may terminate the business process.
There may be multiple alternative routes through a business process, dependent upon various conditions and exceptions. Each should be described at a similar level of detail, as described above.

Example:

> The customer may re-enter credit card information (Step 5), select fewer items to buy (Step 1) or decide not to purchase, in which case the process terminates.

4 Next Stage

Each of the main steps can now be expanded into a series of sub-steps. Within each there may be alternatives. And the alternative steps themselves may need to be expanded into series of sub-steps.

A Main Step in the Business Process

Sub-steps of the Main Step in the Business Process
The breakdown of the main step in the business process into a more detailed series of steps, listed in the sequence in which they occur.
1   1st sub-step of a main step in the business process
2   etc

The detailing of the main step may continue with one or more alternative routes through the main steps that are taken in certain conditions.
In all respects the activity is the same as detailing the main steps, but at a lower level of detail

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The purpose is to fully describe the business process so that there are no missing surprises, and especially to tease out the pieces of information that the steps in the process use, create or store for later steps. Also one should not forget that the purpose, in the specific context of our activity, is to focus on the communication between actors and their processes, and NOT the complete detail of each actor's internal processes.

One continues expanding into sub-steps until confident that all the required information has been identified for the scope that was originally set for the business process, and that the business process has been fully explored.

Note, however, that it may be necessary to expand, refine or contract the scope as a result of the detailed work. Such an amendment should be made with great care and wide agreement.

It should also be noted that review and re-shaping of the overview and breakdowns could go on forever. One should try very hard to stop 'tweaking' minutiae of detail once a good comfortable set of documentation has been reached.

The pieces of information that have been identified as required should be gathered into a dictionary/library. One should already exist, or will soon exist from the Core Component Library work. If there is an entry corresponding to each piece of information which has been identified as required, then the definition should be examined to make sure of the match between dictionary and modelling. If there is no entry, then a new one needs to be formed, which should be done in consultation with the domain area's Core Component activity.

EXAMPLE 1   Buy a Product

This example is taken from the book "UML Distilled Second Edition" by Martin Fowler, ISBN 0-201-65783-X.

Establishing requirements is important and where UML techniques can most obviously be brought to bear. The starting point is Use Cases, and they really drive the whole modelling/development process.

A Use Case is a typical interaction that a user has with a system in order to achieve a goal. Each Use Case is a function that the user can understand and that has value for that user. UML does not specify a standard on how one might describe the contents of a use case, such as pre-conditions and post conditions. The book advocates using those things that really seem to help, certainly not everything in every case.

The example of a Use Case that follows is in a simple narrative form describing its primary scenario as a sequence of numbered steps and the alternatives as variations on that sequence.

Buy a Product

The customer browses the catalogue and adds desired items to the shopping basket. When the customer wishes to pay, the customer describes the shipping and credit information and confirms the sale. The system checks the authorisation on the credit card and confirms the sale both immediately and with a follow-up e-mail. The credit card authorisation might fail, and the customer is allowed to re-try.

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1. Customer browses through catalog and selects items to buy
2. Customer goes to check out
3. Customer fills in shipping information (e.g. address, whether next-day or 3-day delivery)
4. System presents full pricing information, including shipping
5. Customer fills in credit card information
6. System authorises purchase
7. System confirms sale immediately
8. System sends confirming e-mail to customer.

Alternative: *Authorisation failure*
At step 6, system fails to authorise credit purchase
Allow customer to re-enter credit card information and re-try

Alternative: *Regular Customer*
3a. System displays current shipping information, and last four digits of credit card information
3b. Customer may accept or override these defaults
Return to primary scenario at step 6

This Use Case example shows a Scenario, i.e. a sequence of steps describing a successful purchase. The Scenario is one thing that can happen. However, there are alternatives: in the example the credit card authorisation may fail. This is an alternative Scenario of the Use Case. So a Use Case is a set of Scenarios tied together by a common user goal.

EXAMPLE 2   Make a Domestic Payment

Make a Domestic Payment

A Domestic Payment is processed within a domestic environment, in the domestic currency and between domestic resident accounts.

The Payor instructs the Ordered Bank to make the payment. The Ordered Bank debits the Payor's account and, depending on the agreement with the Payor, they can advise the Payor that a debit has been made. The Ordered Bank either makes an Internal Transfer or an Interbank Payment. The Beneficiary Bank credits the Payee's account and, depending on the agreement with the Payee, they can advise the Payee that a credit has been made.

(In a separate business process, the bank(s) will provide the account holders with a statement of transactions on their accounts)

Actors
Payor, Ordered Bank, Interbank System, Beneficiary Bank, Payee

Pre-condition

Ordering Party has determined what funds are available and who and what to pay. The Ordering Party instructs the Payor to instruct the Ordered Bank to make a payment. *(In some cases, the Ordering Party and the Payor may be the same individual or company.)*

Payee has a bank account with the Beneficiary Bank.

Post-condition

Payee's account has been credited and Payee informed of credit.
Payor's account has been debited and Payor informed of debit.

Or the payment has been rejected and the Payor has been informed of the rejection and the reason for rejection. (Payor can then take corrective action.)

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1.   Make A Payment
1.1 Payor initiates payment(s)
1.2 Ordered Bank prepares an Interbank Payment
1.3 Ordered Bank initiates an Interbank Payment
1.4 Beneficiary Bank confirms that Payee Account can receive payment
1.5 Beneficiary Bank credits Payee Account

1.1 Payor initiates payment(s)
1.1.1   Payor prepares a payment order including the sort-code and account the payment is from, Payee sort-code and account, the amount of payment, an indication of when payment is to be made (execution date or beneficiaries value date) and remittance information that is meaningful to the Payee. Payor adds the date of creation of the payment order and gives the payment order an identification.
1.1.2   Payor sends payment order to Ordered Bank
1.1.3   Ordered Bank receives payment order (and applies a reference identification number)
1.1.4   Ordered Bank confirms that Payor can make the payment(s) from the account
1.1.5   Ordered Bank debits Payor account and may advise Payor of debit to account
1.1.6   Payor reconciles debit advice with payment order
1.1.7   Ordered Bank prepares an Interbank Payment (see 1.2)

Alternative: Payor not able to make payment(s) from the account
At step 1.1.4. – Ordered Bank rejects payment(s) and sends Payor a rejection notice including the reason for rejection

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1.2 Ordered Bank prepares an Interbank Payment
1.2.1   Ordered Bank confirms that Beneficiary Bank is a different Bank
1.2.2   Ordered Bank collects payments for a single Beneficiary bank
1.2.3   Ordered Bank prepares payment instruction including information from Ordered Party payment instructions and financial control information. The Ordered Bank includes an interbank payment instruction ID.
1.2.4   Ordered Bank initiates an Interbank payment (see 1.3)

Alternative: Beneficiary Bank is the same bank as Ordered Bank
At step 1.2.1 – Beneficiary Bank confirms that Payee account can Receive payment (see 1.4)

1.3 Ordered Bank initiates an Interbank payment
1.3.1   Ordered Bank sends payment instruction to Interbank System
1.3.2   Interbank System validates payment instruction
1.3.3   Interbank System sends payment instruction to Beneficiary Bank
1.3.4   Beneficiary Bank receives payment instruction and includes their own reference ID
1.3.5   Beneficiary Bank processes payment instruction (see 1.5)

Alternative: Payment instruction fails Interbank System validation
At step 1.3.2 – Interbank System rejects payment instruction and sends notification to Ordered Bank including the reason for rejection. Ordered Bank processes rejected Interbank Payment (see 1.6).

1.4 Beneficiary Bank confirms Payee account can receive a payment
1.4.1   Beneficiary Bank confirms the account exists, the account is not blocked and that the account holder is still living.

Alternative: Account does not exist, account is blocked or account holder is deceased.
At Step 1.4.1 Beneficiary Bank rejects payment and sends advice to Ordered Bank with rejection reason. Ordered Bank sends the Payor a rejection notice including the reason for rejection and returns the funds to the Payor account.

1.5 Credits Payee account
1.5.1   Beneficiary Bank posts credit to account may advises Payee of credit and the date of credit
1.5.2   Payee receives advice of credit
1.5.3   Payee reconciles credit with expected payments
1.5.4   Beneficiary Bank advises Ordered Bank that payment has been made

Alternative: Payee refuses payment
At step 1.5.3. – Payee informs Beneficiary Bank that they refuse the payment. The Beneficiary Bank returns payment to the Ordered Bank. Ordered Bank sends the Payor a return notice including the reason for return and returns the funds to the Payor account.

1.6 Ordered Bank processes rejected Interbank Payment
1.6.1   Ordered Bank determines that the Interbank Payment can not be repaired
1.6.2   Ordered Bank sends the Payor a rejection notice including the reason for rejection
1.6.3   Ordered Bank returns the funds to the Payor account.

Alternative: The Interbank Payment can be repaired
At step 1.6.1 – The Ordered bank repairs the Interbank Payment and initiates a new Interbank payment (see 1.3)

Definitions:

Beneficiary *(actor)* – The party who is ultimately credited or paid as a result of a transfer or payment.

Beneficiary Bank *(actor)* – The financial institution that serves the payees account on which the funds are credited

Interbank System *(actor)* – The system for exchanging funds between two different banks

Ordered Bank *(actor)* – The bank or financial institution that is ordered to make the payment(s)

Ordering Party *(actor)* – The party who originates a payment order.

Payee *(actor)* – The credited account owner. (The parent company account owner when the Beneficiary is a subsiduary company of the parent company.)

Payor *(actor)* – The debited account owner. (When the Ordering Party is different from the account owner. For example, the parent company account owner when the Ordering Party is a subsiduary company of the parent company.)

Ordering Party *(actor)* – The party who originates a payment order.

Payee *(actor)* – The credited account owner. (The parent company account owner when the Beneficiary is a subsiduary company of the parent company.)

TEMPLATE

Name the Business Process
Give a high level description of the overall process sufficient to establish the scope of the business process, so that the detailed analysis can be focused and not stray into other processes.

Actors
List the roles that the different parties play in the business process.

Pre-condition
List the conditions, often the results of other business processes, that must be fulfilled before the business process can be started.

Post-condition
List the conditions that will be the result of the business process being detailed in this document.

Name the Business Process
2.   Name the 1st main step in the process
3.   Name the 2nd main step in the process
4.   etc

Alternative: Name the circumstance in which an alternative step is taken
Name the step at which the alternative is taken
1   name the first alternative step
2   etc
Name the step at which the main process is continued

Alternative: etc

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