Model Builder

**User stories**

General  
The Model Builder is intended for several types of users that are significantly different, likely needing very different work surfaces/ GUI. The users have different competences and some work at different levels of granularity.  
Common for all users is the goal of making design decisions that are optimal in both a holistic perspective as well as at the detailed level, and to capture the decisions by enriching a common set of asset information. Users need to have transparency to the full information, and be allowed to choose zoom levels, aspects, and filters interactively. Users of the same kind may have several levels of authority, depending on credentials, and be allowed several levels of operations.

Users:

1. Main Process Engineer – primarily working with the overall functionality requirements of the asset as a facility that processes streams of various kinds. The user has primarily an input/output view of the functions and streams. Main goal is to define core functionality and requirements to the entire asset as a process. Emphasize on the Functional aspect.  
   (Legacy formats: narratives, block drawings, calculations, design reports)
2. Systems Engineer – primarily working to manage the complexity of the asset as being a system of systems with a high level of complexity and numerous interfaces. The user has primarily a system break-down structure view of the asset. Main goal is to ensure the integrity and quality of system design across all disciplines, and along the whole life cycle of the design. Balanced emphasize on all aspects.  
   (Legacy formats: Master Equipment List MEL, Work Breakdown Structure WBS, reports)
3. Detail Process Engineer - primarily working with delimited processing functions that are part of the overall process. Main goal is to define the detailed process, and to set the (equipment) requirements needed to fulfil these. Emphasize on both the Functional- and Product- aspect, but also working with the Location aspect.  
   (Legacy formats: Process Flow Diagrams, P&IDs)
4. Electrical Engineer –   
   TBD
5. Automation Engineer -   
   TBD

The list of users is in order of priority.

User Story 1 – Main Process Engineer

My name is Carl. I am a senior process engineer. I usually work at the very early phase of projects when the overall design is determined.

Today we have received the design basis for an offshore field development. This is an oil and gas field that will need water injection for reservoir pressure support. Energy will be provided by means of a cable from shore. The field configuration is 1 host platform, type Jacket, and 1 subsea satellite. The host produces to a receiving facility through pipelines.

I am part of a team who will develop the high-level process design.

In my role I view everything as fundamentally the processing of **streams**. An offshore platform is basically a facility with input streams and output streams. The streams are of type **Energy**, **Material**, **Information**, and **Force**.

These are the steps I take:

1. I define the platform as a **function system block** (**FSB**) with inputs of crude oil, gas, energy, and information. To do this I pick from a list of pre-defined types of FSBs.
2. Next, I define the subsea satellite by picking another type of function system block.
3. Next, I define the receiving end of the exported fluids as an FSB similarly.
4. Since it is the main process that is my first interest, I leave the details of the energy and information streams for later.
5. Now I define the Material streams going between the FSBs, for instance the stream of crude oil going from the subsea satellite to the platform, and the stream injection water going from the platform to the subsea satellite, and so on until all streams are defined.
6. The high-level process now defined; I go on to define parameters. To do that I follow the streams, beginning with the source(s), and continue to the destination(s).
7. I let the set of streams define the functionality of each FSB. For instance, when crude oil needs to split into gas, oil, and water, a **Split** type FSB is required.

Offshore platform

FSB - Split



FSB – Rec’ve

FSB - Source



Receiving facility

Subsea satellite

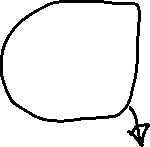


When this is done, I have the streams defined from beginning to end, including values of the main parameters. Next steps:

1. Based on the provided inputs and the desired outputs, I progress to define the required functionality and parameters (capacity etc.) of the Offshore platform FSB, to the extent they can be determined at this stage.
2. At this early and high-level stage I essentially work in the Functional **aspect**, and only later can I begin to assign Location and Product aspects.
3. Before breaking the system of FSBs and Streams further down into sub-systems, I begin (if I did not already) to assign names and codes to each FSB:
   1. Descriptive names (Acne-A platform)
   2. RDS category codes (=A ‘Offshore complex’)
   3. FSB types (Split)
   4. and similarly to each Stream:
   5. Descriptive names (Acne-A to Shore pipeline)
   6. RDS category codes (=WP ‘Closed enclosure guiding object)
   7. Stream types (Material)
4. Next step is to break the system down into a hierarchy of sub-systems, defining functions and parameters at each step.

Offshore platform

FSB - Split



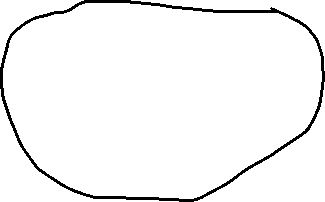
FSB – Rec’ve

FSB - Source



Receiving facility

Subsea satellite



At some level of depth in this hierarchy the functions I have now defined in the Functional aspect become so concrete that I can determine how the function can be **fulfilled\_by** in the Product aspect, and where **located\_as** in the Location aspect. For instance a pump function can be fulfilled\_by a pump product, which is located\_as the pump location. To do this, the block schematic format of my user interface is no longer appropriate, and I need to swich to the tree-structure user interface to continue. Except that is not my job, it is the job of the Systems Engineer, I think.