TELMACO

The Data Movement Sequence Diagram (DMSD)

The Data Movement Sequence Diagram is a diagram that shows the sequence of Data Movements in a Functional Process. Originally devised by Peter Fagg of Pentad Ltd and subsequently adopted by Grant Rule of SMS Ltd for use in their COSMIC training courses, they have taken the challenge of making these benefits available to the COSMIC domain. The visually informative aspect of the DMSD has contributed to make it popular in the COSMIC professional sphere.

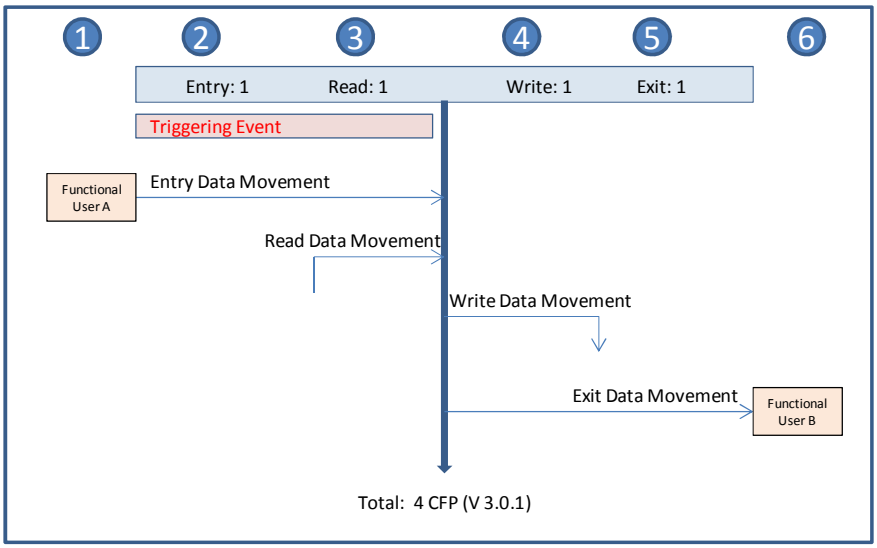
The description

The central time line represents the processing flow of the Functional Process, and the horizontal lines represent the Data Movements. The horizontal space of the diagram is divided into 6 columns. The first information on the time line is the Triggering Event which is the cause for initiating this Functional Process. The first Entry type Data Movement comes immediately afterwards. The Entry occupies columns 2 and 3, thus linking the entering Functional User name in column 1 to the time line.

The Read Data Movement is represented by a broken arrow starting from an invisible “Persistent Storage” and joining the process line with a retrieved Data Group. It occupies column 3.

The Write Data Movement, occupying column 4, is represented by a broken arrow starting from the process line with a Data Group and storing it down to an invisible “Persistent Storage”.

The Exit type Data Movement, in columns 4 and 5, links the process time line to the Functional User expecting the exit of a Data Movement.



This structure shows the Entries in column 2, the Reads in column 3, the Writes in column 4, and the Exits in column 5. This alignment makes it possible to sum up the number of these at the top of each column and to see immediately their contribution to the COSMIC size. At the bottom of the diagram we find the COSMIC size of the Functional Process.

Naming the Data Movement

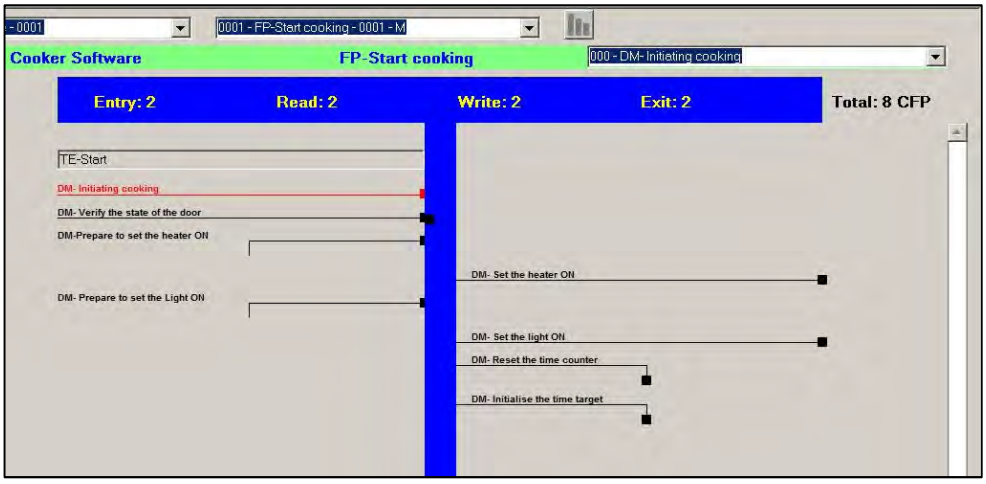
The name of the Data Movement is positioned on its pictorial representation. In some usage, the name can be a composite name including the name of the particular Data Group transported by the Data Movement. The recommended notation would then be:

DM-name.DG-name

Note on the sequencing:

From a COSMIC measurement viewpoint, the only sequencing to be respected is the position of the triggering Data Movement. It has to come first. Because of the concern for their uniqueness and the sole interest in their number, the other Data Movements constituting the process, do not need to be rigorously sequenced in order to establish the COSMIC count.

- However, for practical considerations, it is helpful to ensure a correct sequencing, as the visual examination of the DMSD helps find possible omissions or redundancies of Data Movements.



An example of realisation of DMSD in the COSMIC measurement tool MeterIT-Cosmic

Use in Process Specification

DMSD could also be used as a semi-formal specification method for Functional Processes. In this case, the sequencing feature of the diagram would be necessary in order to correctly describe the functionality of the Functional Process. The normal specification practice may lead to the occasional presence of redundant Data Movements, thus infringing COSMIC Rule R-09. When this is the case, it should be possible to surcharge the graphic element with a symbol such as X to identify this Data Movement, in order to remember it as not to be counted.

This illustrates the benefit of carrying out any COSMIC measurement at the same time as the activity of software specification, as both practices require the same type of information, possibly structured similarly.

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