Mapping Processes

Notebook for project 'Blokko' Logistics and mobility

Information derived from;
111 instrumenten voor kwaliteitsverbetering
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Acedemic year: 2011 - 2012

Process flow-diagram

Goal
The process flow-diagram is an instrument to show the flow within a process from a logistic point of view. Specially to achieve a reduction of throughput and process costs

How does it work:
By following the process form the view point of the product is being mapped which activities are involved and how much time every single activity takes. This method is specially suitable to determine the relation between the actual process time and the total throughput, considering to shorten throughput times and efficiency of the total process.

Example:
The process dealing with complaints is studied in this process flow diagram to analyse the total throughput.

Procesflow-diagram

datum:	21 november 2003
proces:	afhandelen van klachten
start proces:	ontvangen van de klacht bij klachtenbemiddelaar
einde proces:	inhoudelijke afhandeling, alle betrokkenen geïnformeerd en alle stukken gedocumenteerd en opgenomen in klachtenregistratiesysteem
opgesteld door:	WvV

entiteit:
dossier

stap in proces	bewerking ○	transport ⇨	inspectie □	wachten D	voorraad ▽	tijd [dagen]	kosten [€]	afstand [m]
klacht inboeken						0,5		
klacht op leesstapel leggen						4		
klacht lezen						0,25		
documentatie opvragen						0,25		
wachten op ontvangst documentatie						14		
samenvoegen documentatie						0,1		
vormen van een oordeel						0,25		
plannen van vervolgacties						0,1		
uitnodigen betrokkenen						0,1		
wachten op gesprek met betrokkenen						14		
voeren gesprek met betrokkenen						0,5		
samenvoegen informatie						0,1		
wachten tot oordeelsvorming						7		
vormen van oordeel						0,25		
wachten tot verwerking oordeel						3		
verwerken oordeel						0,1		
wachten op ondertekening						3		
oordeel ondertekenen						0,1		
wachten op verzending brieven						2		
verzenden brieven						0,1		
documentatie in systeem zetten						0,2		
wachten op verwerking in archief						15		
spullen in archief plaatsen						0,1		
in archief bewaren								
totale verdeling in tijd	2,5	0,3	0,2	62	0			

Approach:
1. Decide what entity you want to follow, e.g. an order, product ore file.
2. Define the beginning and the end of the process.
3. Define all activities in the Total process, follow in your mind the entity through the process. Ask your self the question: I'm the file, what happening to me while running through the process?

4. Establish for every single step in which category it belongs:
    a. Processing (a value added step)
    b. Inspection or testing
    c. (working) inventory
    d. Transport
    e. Storage
5. Connect all points in the analysis through a red line.
6. Define per situation use of time and costs.
7. Divide, for calculation of the Value Added Efficiency, the total of the times where you add value through the total throughput time.

Remarks:
- The choice of the entity is essential. Example:
    o At the assembly of an order out of different parts, a carton box for gathering all the different parts, is chosen as an entity; the filled box is than the final product.
    o In the process flow of the manufacturing of a bike the frame is the entity to be followed. After that, all kind of other parts are added to the frame (paint, handle bars, pedals, documentation, box).
    o In an administrative process it is possible to choose, as the entity, the file where to, during the process, documents are added
- Some times transport can be a value added actitvity, e.g. the evaporation of wet paper on the rolling mill in a paper factory
- Some times waiting can be a value added activity; e.g. the maturation of wine in wooden casks.
- Don't forget the 'steps' like 'waiting for treatment' or 'on a pile of papers'.

SIPOC-diagram

Goal;
The SIPOC-diagram is an instrument to create a schematically overview of active process steps, input used and the output created out of these processes.

How does it work?
By persistent following the process and describe all relevant input and output, one creates a clear picture of all possible sources of variation and results, as well as the basic requirements for these elements, necessary for a good overall process result. The abbreviation is from the English approach:

Suppliers supply **I**nput tor the **P**rocess and the **O**utput will go to **C**ustomers.

Example
The production of a Volvo car. One of the companies involved is FUNDIA. They produce steel wire for the production of leaf springs. The process at FUNDIA starts with the 3,5 meter long steel bars from CORUS. At FUNDIA they are heated up to a temperature of 1200 degrees Celsius. After that the steel bars are rolled in to an inch thick wire of 2,5 kilometres long and wind up on a wheel. This wheel with wire is the final product and is transported to Volvo were they make leaf springs out of it. The SIPOC diagram of the process could be drawn as follows:

supplier	Input	proces	output	**customer**
Corus	steel	heating		
		rolling	Steeld wire	Volvo
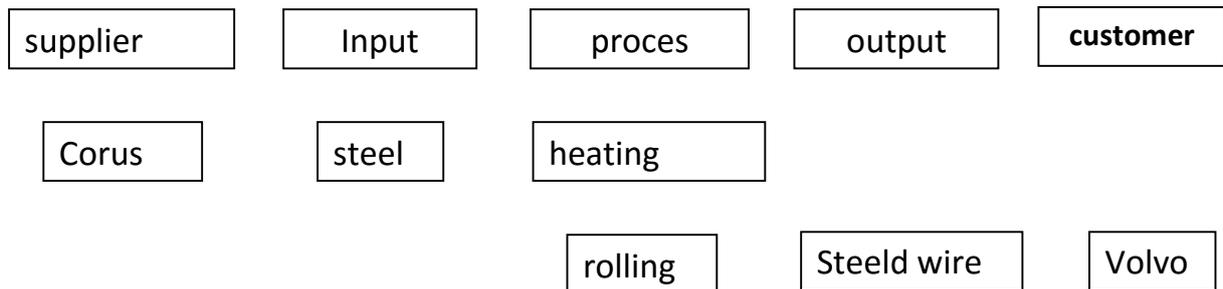
Approach:
Divide the space on your form in 5 columns and put the activities within the process just like in a flowchart (that is: use a verb: 'heating', 'rolling' after all it is a process)
- Write on the left side which input is used
- Write further left, from which supplier the input is originating
- Write on the right hand side what the result of the process is
- Write further right who will benefit from the output

Remarks;
- This diagram is easy to expand by adding all required specifications and values for the in- and output
- Use only value added activities in this diagram. Because they are of importance for the realisation of the final result. Decisions and documents are more likely to be used in flow charts.
- More details about in- and output for (sub) processes are mostly used in process maps.

Brown paper

Goal
A clear overview of the total flow of information and documents within a process.

How does it work
By visualizing the complete flow of information within the process from the beginning to the end, understanding of the activities is enlarged and from here one is able to search for improvements.

Example;
The analysis of the flow of a complaint within an organisation gives a clear view of whom is generating which information and how this information flows through the total company
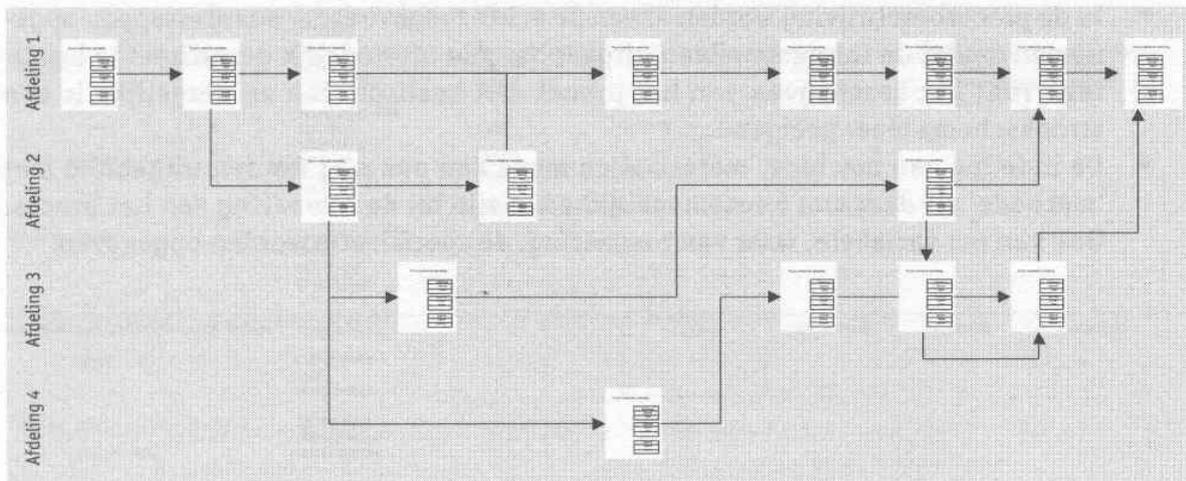
Approach;
1. Take a long sheet of paper (e.g. the Brown rapping paper use by many companies to rap their products) and stick it up on the wall
2. Define one product or service which is representative the total process
3. Reduce the size of all documents used in this process to an A5-size.
4. Start with the process and stick all the documents (from step 3), one by one on the paper sheet.
5. Connect all forms and documents through lines to show the flow.
6. At the bottom is noted who is doing the activity and is generating the information.
7. Discuss what is done with the information. Ask your self the question; "who is doing what with the information and what will happen if we cut this step"
8. Erase all useless information.
9. Redesign the process.

Remarks

- The basic scheme can be extended with all kind of functionalities: e.g.
  - Red stickers to mark vital information;
  - Exclamation marks to show frequently made mistakes;
  - Question marks to show missing information.
- It is also possible to note how the information is filed, by how and for how long.

- The throughput could be noted.
- In stead of lines on the paper one could use pins and woollen treats. Which makes it more flexible to use. The old process with lines is over lapped by a new design by the use of the treats.
- Also easy to use, sticky yellow papers. Makes 't very flexible to, especially in the beginning of the mapping

Flow chart

Goal;
The flow chart is an instrument to visualise the flow of a proces (often in procedures!)

How does it work;
Through the use of graphical symbols to mark the activities in a process, a clear view of the process is established. The symbols are standardized!
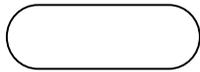
Terminal; symbolises the beginning and end of the procedure.
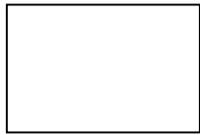
Process; shows de activities in a procudere. In this symbol a verb is always used.
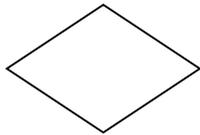
Decision, always contains a question. Depending on the answer, mostly placed on the outbound lines the procedure continues.
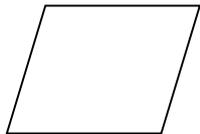
Input/ output; shows what is entering the process and what is coming out of it (could also be a form ore document; see below)
In most cases a process starts only when a product or document enters, so a start symbol is followed by an input/ output-symbool.
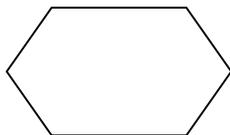
Parameter; list of items to check, e.g. control points in a process.

Document; indicated is what kind of document in a process is used. (exemple: a work instruction) or which document is leaving the process (e.g. an offer). The direction of the arrows indicates if the document is used in the process (arrow points from the document to the process) or is generated by the process. (arrow points from the process to the document symbol).

NB: this is the approach used by the author of the book; "111 instrumenten voor kwaliteitsverbetering".

Personally I prefer to use in a flow chart the SIPOC approach. Where there is a clear separation between input, process and output. So left, always the input, in the middle the process and right the out put!

input → proces → output
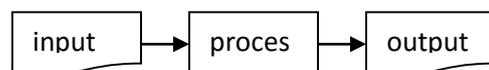
Example;
To make an appointment for a lunch at a restaurant you could make the next flow chart:
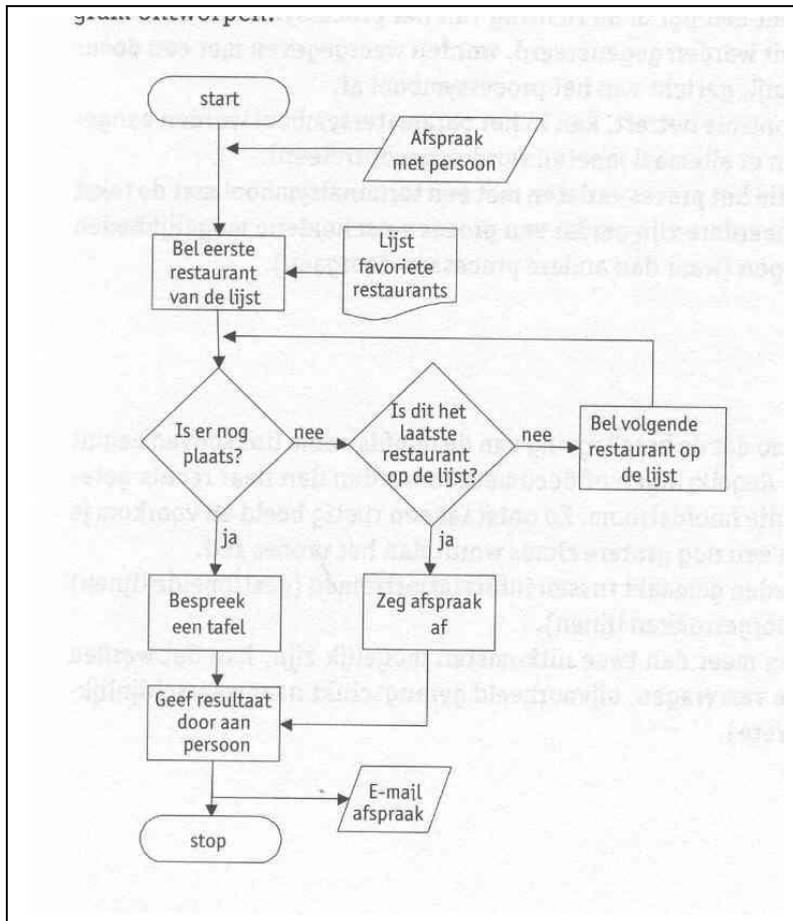
Apporoach:

1. Define which process has to be mapped.
2. Define the borders of the process, what comes in is input, every thing that leaves the process is output.
3. Start drawing the chart whit the terminal symbol and add 'start'.
4. Draw a the input/ output symbol underneath (right hand side) and indicate what the trigger is of the process / procedure
5. Draw the first activity in the process symbol, connect this with a line from the start symbol and connect the input symbol with this line.
6. follow all activities and decisions within the process as if filming it. The activities are draw with the process symbol, and the description is always a verb. Decisions are draw with the decision symbol and are almost all ways questions!
7. Documents used in a process step are linked with an arrow pointing towards the process symbol. Documents generated by a process are linked with the process through an arrow pointing towards the document. *(NB: see previous remark!)*
8. If an activity is an inspection, the parameter symbol can indicate what should be checked!
9. End all flows leaving the process with the terminal symbol "END" if there is no further action in this process. If there is an new process involved give the terminal symbol the name of the 'new' process

Remarks
- Draw the process always so that the descriptions of the main flow starts in the top left part of the page and ends in the bottom left part of the page.*(NB: see previous remark!)*
  Information flows and material flows could be distinguished by the use of dotted lines for information and 'normal lines' for materials
- If at a point of decision more than two answers are possible than it is possible to solved that by using a series of questions, for example classified in the probability that something happens (Pareto)
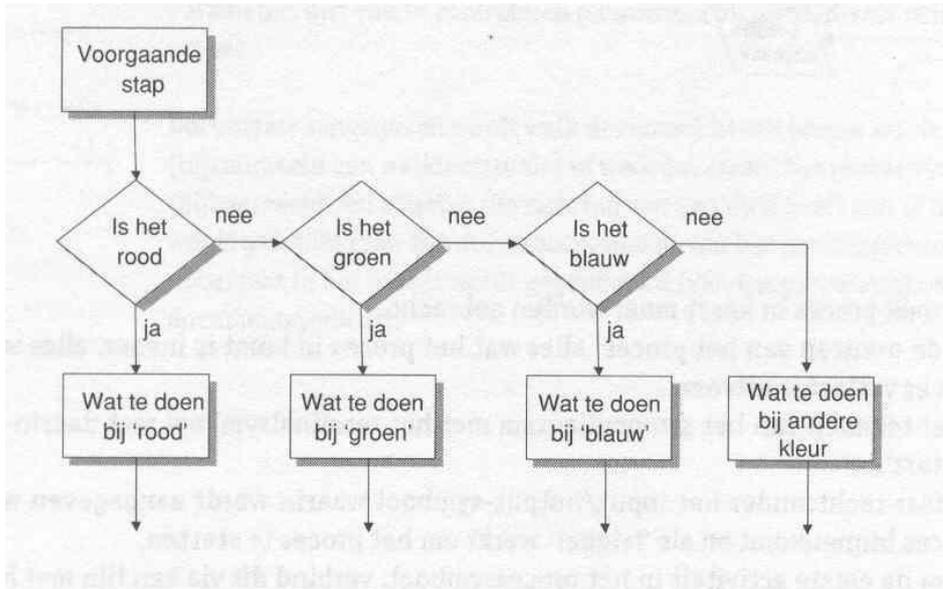
NOTE:

There are at least 2 more techniques to map processes. For the time being they might be a bit to much but never the less they could be very usefull.

- VSM;   Value stream mapping (very often used in lean thinking)
- IDEF 0; used in very difficult processes (e.g. aerospace companies)