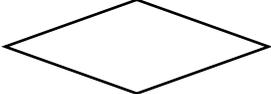
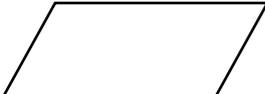
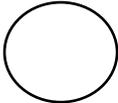


A flowchart is a type of diagram that represents an algorithm, workflow or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. Flowcharts are used in analysing, designing, documenting and managing a process or program. Flowcharts help visualize what is going on and thereby help understand a process, and perhaps also find flaws, bottlenecks, and other less-obvious features within it. The most common types of symbols use in flowchart are presented in table 1:

**Table 1. The symbols of flowchart**

	<p>An oval is used to denote the <b>start and the end of a process</b>. They usually contain the word "Start" or "End", or another phrase signalling the start or end of a process, such as "run the machine" or "send the shipment".</p>
	<p>A rectangle is used to <b>denote a process step</b>, an activity or an operation. It may also represent an entire subprocess. It is used to show that something is performed. Examples: "cutting the boards", "sign the shipping document", "save changes into the system", etc.</p>
	<p>A diamond is always <b>used to denote a decision point</b>. This is usually a "yes" or "no" function but could also represent an "if - then". The conditional symbol has two arrows coming out of it, usually from the bottom point and right point, one corresponding to Yes or True, and one corresponding to No or False. The process flow branches off in to or more directions here. The next step in process depends on the decision. For example. Check the documents. If everything is signed - accept delivery. If it is not signed - return the delivery.</p>
	<p>This symbol <b>denotes preparation</b>. Shows operations which have no effect other than preparing a value for a subsequent conditional or decision step.</p>
	<p>A parallelogram denotes <b>an input</b> to the process or <b>output</b> from the process.</p>
	<p>This symbol represents a documentation or paperwork produced or required by the process.</p>
	<p>A circle is used as a connector (from the chart or page to another, with numbers if necessary).</p>
	<p>A line with an arrow always indicates the path and direction of flow in the process.</p>

A necessary step to in improving a process is to flowchart it. In this way, all parties involved can begin with the same understanding of the process. It may be revealing to start the flowcharting process by asking several different team members who know the process to flowchart it independently. If their charts are not the same, a significant problem is revealed at the outset (there is not a common understanding of the way the process work). Another strategy is to ask team members to chart how the process actually works and then chart how they think it should work. Comparing the two version can be an effective way to identify causes of problems and to suggest improvement possibilities.

The example of flowcharts shows figure 1:

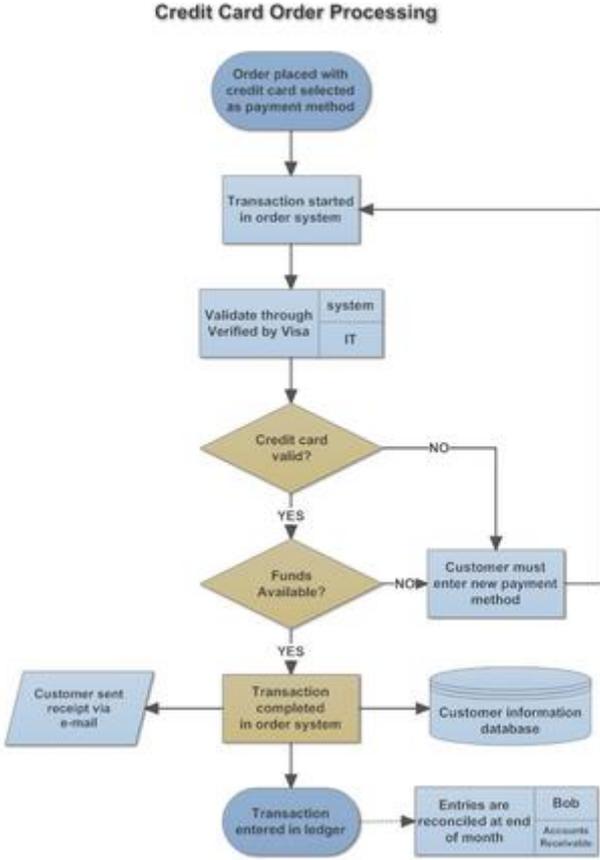
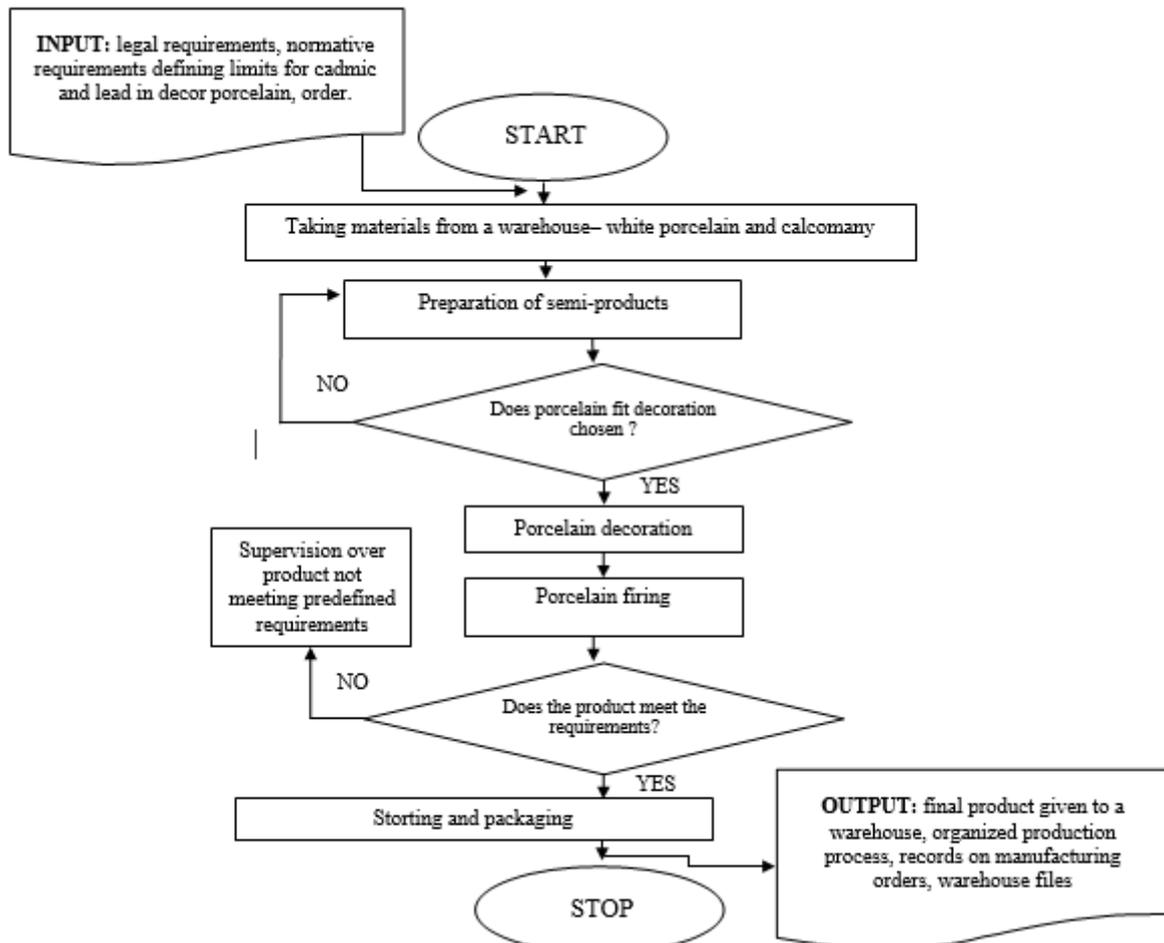


Fig. 1 Example of flowchart (www.smartdrow.com)

## Exercises to do:

1. Choose a production process (eg. production of chairs, production of pizza, production of plastic packaging, decorating of porcelain). !!! You can use the same process which you have developed with Jan Dmochowski on other subject.
2. Define input into the process. Include:
  - Legal requirements (example the law on general product safety)
  - Normative requirements (example some obligatory standards and non obligatory like ISO 9001)
  - Material resources (raw materials, for example white porcelain)
  - Physical resources (equipment, for example porcelain kiln)
  - Other if required
3. Draw a flowcharts

For example:



4. Define output from the process. Include effects of process – product and all type of documents generated by the process.