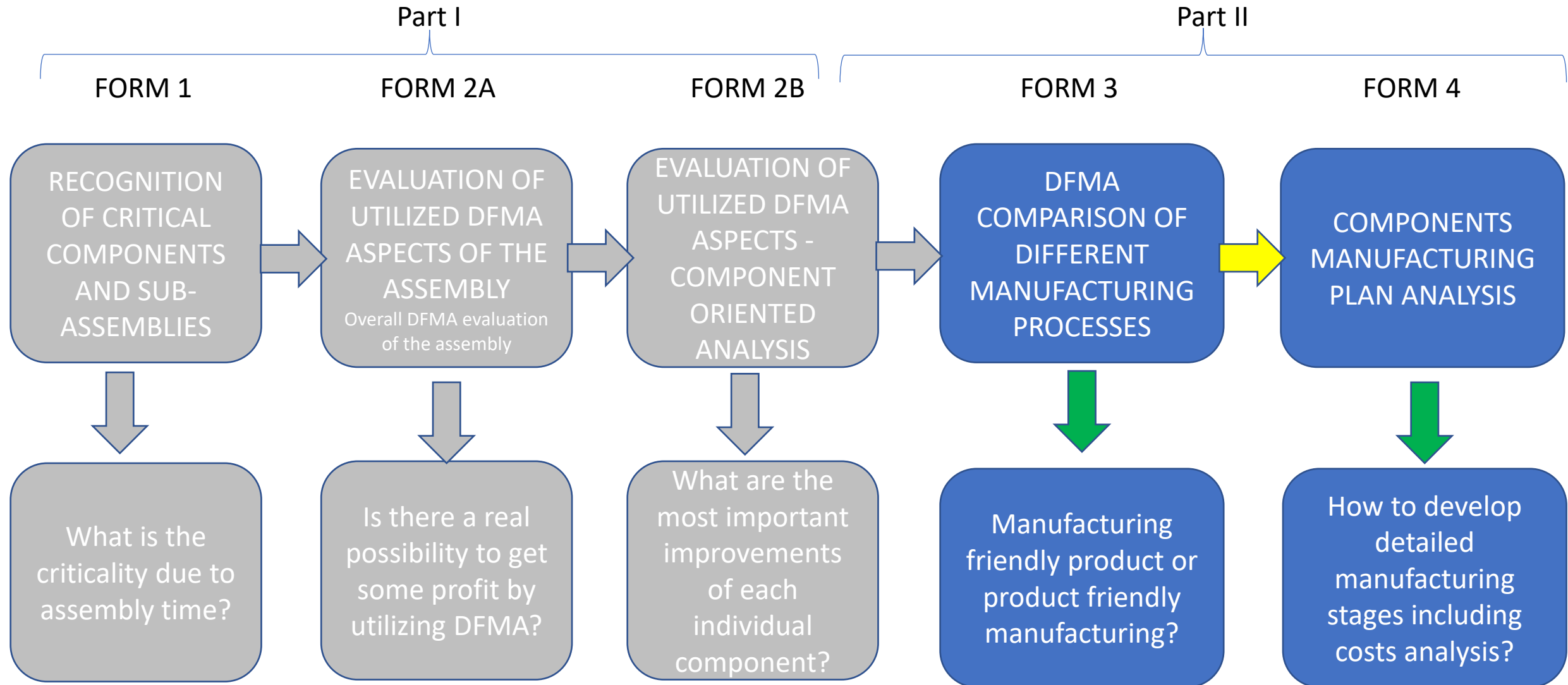


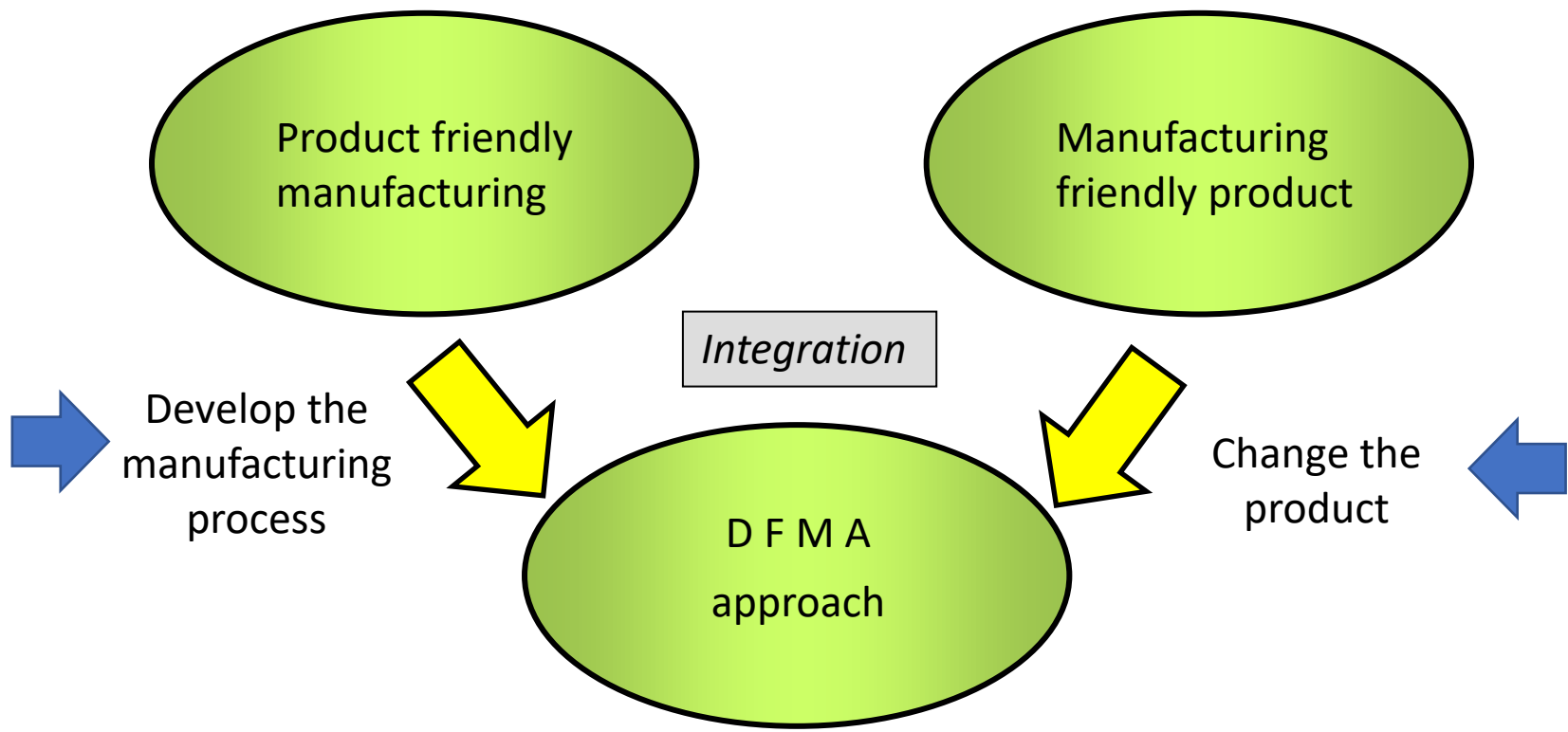
GUIDELINES FOR UTILIZING DFMA FORMS

Part II

Overall picture of DFMA forms



- Specialized manufacturing processes
- Changes of
- Process variants
 - Robotization
 - Automatization
 - Mass production



- Changes of
- materials
 - geometries
 - dimensions
 - assemblies

DFMA Form 3: DFMA COMPARISON OF DIFFERENT MANUFACTURING PROCESSES

Evaluation criteria	Results
1. What are the facts which support the use of the intended manufacturing process?	- - -
2. What are the facts which limit the use of the intended manufacturing process?	- - -



Name the most probable manufacturing process for each component, make several trials
 Use e.g. additional SWOT

4. What aspects affect the most the manufacturing costs (due to the process itself)?	- - -
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Describe the production volume and its relationship with the production costs (e.g. mold costs)
 Try to find the critical limit

8. What are the typical work piece size and number of items required for cost-effective serial production?	
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7. Evaluate the options to utilize mechanization, automatization or robotization to increase productivity:	<u>Mechanization</u> : 😊 😐 😞 Automatization: 😊 😐 😞 Robotization: 😊 😐 😞
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11. Evaluate the viewpoint of local and global manufacturing if the intended process is utilized:	
12. What comparison viewpoints were based on numerical (or otherwise objective) criteria?	- - -
13. Overall evaluation of the suitability of the intended manufacturing process:	

An example: In general, it might be easy to weld some steel grades together, but the position of the weldment is so complicated that robotized welding is difficult and manual welding is challenging. In this case, from the DFMA point of view, the weldability is poor. This could be “measured” e.g. with the total production time needed for making the joint.

Try to find a real company which could take of the manufacturing if needed. Try to recognize possible limitations which are e.g. related to some properties of specific manufacturing tools or equipment

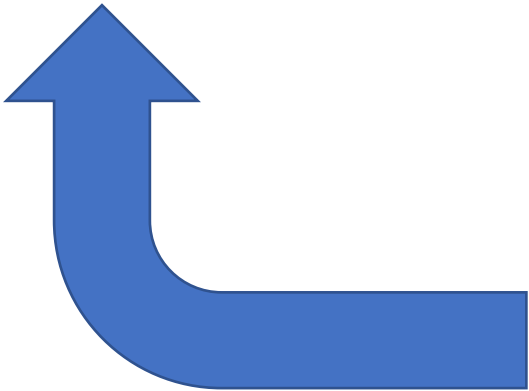
If possible, numerical evaluation is better than qualitative estimations

DFMA 4: COMPONENTS MANUFACTURING PLAN ANALYSIS

2 Recognized manufacturing stages and their order of priority					
Stage 1 (figure)	Stage 2 (figure)	Stage 3 (figure)	Stage 4 (figure)	Stage 5 (figure)	Stage 6 (figure)
Stage 7 (figure)	Stage 8 (figure)	Stage 9 (figure)	Stage 10 (figure)	Stage 11 (figure)	Stage 12 (figure)



The purpose is to present concrete improvements to the manufacturing stages of the component



- Required tooling, tools, measuring equipment, jigs etc.
- Process and control parameters
- Inspection and the quality control of the component
- Evaluation of manufacturing time and costs

7 Evaluation of manufacturing time and costs					
Manufacturing stage	Additional time	Production time	Capital costs	Material costs	Tooling and tool costs
1					
2					
3					
4...					
N					
Total:	$\Sigma=$	$\Sigma=$			
Total time:	$\Sigma=$		$\Sigma=$	$\Sigma=$	$\Sigma=$
Additional costs:		Total costs: $\Sigma=$			

Reminder...

- You should fill two sets of DFMA forms:
 - The first for the original construction and components
 - The second for the improved construction and components
- The conclusions should be drawn based on the differences found from the numerical results which are presented with the DFMA forms

