Project: MEMSLAND
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1. Introduction

This document describes in brief the specification for the planning and scheduling solution for MEMS industry process. Limis wants to enlarge its planning engine to be able in supporting shopfloor workers, middle management and leading management in obtaining a clear insight into planning and scheduling decisions. The Limis software will be fed by data coming from the 'Living Database' concept by Phoenix. Phoenix is another partner in this MEMSLAND project.

Within the MEMSLAND project plan this document is part of the activities in WP2.

2. Goal

The goal within this MEMSLAND project is to create a demonstrator system where design, risks and thus costs and planning functionalities are fully integrated into one decision support system.

At top and middle management level the system will inform about expected bottlenecks and realistic delivery dates for new orders. At shop floor level the system will provide a detailed schedule for the production process based on scheduling rules and optimalisation algorithms.

3. Global production flow

1.1. Introduction

The communication protocol for end users (EU) and producing users (PU) is shown in the next picture:

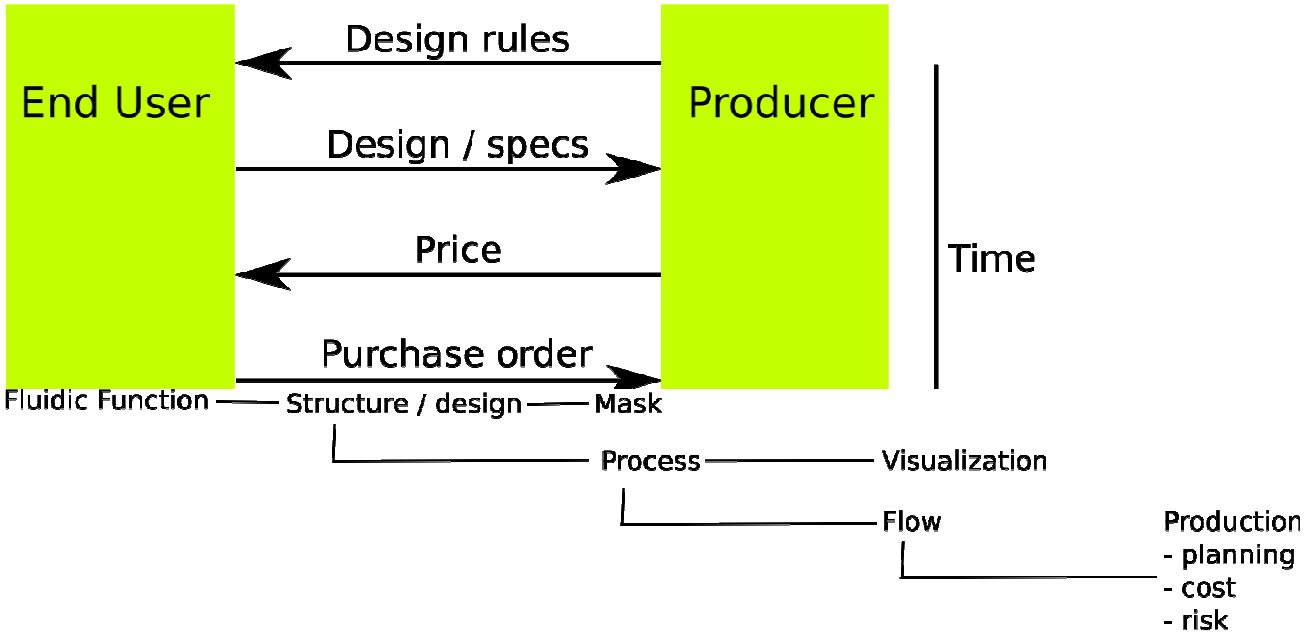

Illustration 1: Functional dependancy between aspects of a micro device

1.2. Specific production requirements

After obtaining the production flow for a device from the 'Living Database' the scheduling algorithm must deal with:

- Varying production batches:
  Production batch sizes may vary throughout the production process. From slices to individual devices and half fabricate stock levels.

- Expected and real yield constrains:
  The expected yield in a production flow will be a obtained as part of the flow characteristics. However during the first production runs this yield should be overruled by the measured yield coming from the operators.

- Stock levels:
  In every step of the production process part of the batch (or even the whole batch) may be put on stock for future use.
  Scheduling new production orders the system must take into account these actual stock levels and should come up with an optimal cost effective production planning.

- Men and machine capacity requirements
  Since operators often are the critical factor in the production of devices the scheduling algorithms should take into account both the available man and machine capacity individually. Exchange of operators should be limited only

within an available predefined skill matrix.
Man capacity requirements can also depend on available shifts. The decision to put in an extra shift should be obtained from the global work load graphs in the system.

- Equipment may also have its specific characteristics such as minimum and maximum packages. Setup times (setup matrix), downtimes, etc.

1.3. System technology

Finally the whole system should have a web based user interface. Supporting several type of web browsers.

1.4. Interface technology

Interface with external systems providing the required production data will be XML based. In cooperation with Phoenix software engineers first steps are taken to develop a first version of exchange of data based on this interface mechanism.

4. Next steps

Within the MEMSLAND project the next steps in developing the business demonstrator are:

- further implementation of a demonstrator system based on test data and real life data.
- development of scheduling rules
- integration tests
- involvement of end users to participate in the evaluation of the system performances.