An approach to identifying the ideal time to perform an FMEA during the product development process

Würtenberger Jan, Kloberdanz Hermann • product development and machine elements pmd

Motivation

The literature contains varying recommendations on the best time to perform an FMEA.

Cost per failure

Level of information

The earlier a failure is identified, the lower the resulting costs of rectifying it.

Level of information

The later a FMEA is performed, the better the level of information and the benefit of the results.

Approach

The conflicting parameters costs per failure, level of information and quality of information are analysed.

Working steps to identify the ideal point of time to perform a FMEA

The level of information is systematized to an instant of time by using product and process models. First, the systematized level of information is evaluated using the Information Quality Framework. Second, the level and quality of information is compared with the performance requirements of an FMEA. With this help, it is possible to allocate FMEA types to the steps of product development of VDI 2221. Finally, trends of the dimensions, such as the costs per failure, are optimized, limiting the possible range of performing the FMEA type.

Method for identifying an ideal time to perform an FMEA

The results demonstrate dependencies between the level of information, the quality of information using the Information Quality Framework and the requirements of the FMEA. With this help, trends of the dimensions are identified, which are used to optimize the point in time to perform an FMEA. This is an important contribution to making product more robust:

- Failures are analysed at the right time.
- Designers have to think about the available level and quality of information used to perform an FMEA.
- The product itself is analysed before the FMEA starts.

Evaluation of the approach

A pneumatic cylinder is used to evaluate the approach, which has to fulfill the use process lift a load. The level of information during the product development process is illustrated using completed product models. The identified trends of the dimensions out of the Information Quality Framework can be confirmed.

Conclusions and outlook

Identified dependencies