UNIVERSITÄT ZU LÜBECK

TECHNISCHE HOCHSCHULE LÜBECK

Master thesis

Topic:
Exploring Process Mining Techniques in Repair Service of Endoscope

Summary:

This thesis investigates the application of process mining in the service sector of medical devices, focusing specifically on compliance checking. A comprehensive literature review revealed that existing research predominantly addresses process discovery, with limited emphasis on conformance checking and no existing frameworks exist for the service environments of medical device companies. To bridge this gap, the research aimed to develop a framework for conformance checking using process mining techniques for this sector.

Process mining use different techniques to extract insights from event logs, facilitating the discovery, monitoring, and improvement of business processes. Event logs are extracted from Process Aware Information Systems (PAISs), such as Enterprise Resource Planning (ERP) systems, to visually map the as-is execution of a company's processes. For conformance checking, these mapped processes are compared against predefined Business Process Model Notation (BPMN) diagrams to identify non-conformities between actual and intended processes.

The research methodology involved two primary steps: developing a framework and validating it through a case study. The framework, named PMCC, was designed to check conformance and address the predominantly unstructured processes in the manual repair services of the medical device companies. The core idea of the framework was to address complexity by focusing on a sub process and choose this sub process by the help of ISO 13485.

The PMCC framework was evaluated through a case study conducted within Olympus Corporation. The results demonstrated the framework's effectiveness in identifying and continuously monitoring non-conformities within the company's service processes.

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