SERVICE MEISTER

AUTOMATIC ASSIGNMENT OF SERVICE TICKETS WITH FREE TEXT ERROR DESCRIPTIONS

A ticket system for handling service, warranty and other requests is often inefficient. Free text descriptions, in particular, must first be read and interpreted by people before a ticket can be assigned to a department or topic. Only then can further processing proceed. Algorithmically, tickets with free text descriptions can be assigned to predefined categories, eliminating the need for manual assignment and optimising ticket processing.

FOR THE FOLLOWING CHALLENGES

- Efficient processing of tickets
- Acceleration of service processes
- Cost saving
- Reduction of downtime due to repairs/equipment replacement
- Increasing customer satisfaction

THE USE CASE

- Equipment defects are reported to the manufacturer by customers. The initial error description is recorded and stored in the ticket. After that, the service process continues with the collection of the device from the customer, repair, and return shipment.
- The customer has to do without the device for several days due to shipping and repair times.
- The service must have a large number of spare parts in stock to keep the repair time as short as possible.
- When the customer describes the error to the service personnel, the error pattern is described, but neither the customer nor the service personnel usually know the cause. This is first diagnosed by specialists of the repair team.
- Accordingly, the clear assignment to error classes only takes place after the corresponding service specialist has inspected or dismantled the device.

Automatic recognition of defined error classes from the initial free text description (plus metadata such as device type, age and so on) can speed up service processes and thus reduce downtime and costs.

THE SOLUTION IN DETAIL

Natural Language Processing is used to train a model that, together with other features such as device type, device-specific error classes, or device age, can predict the probability of belonging to an error class.

- The model is first trained in a controlled manner, that is, using historical data with known error classes, and can then predict the error class based on device type, device age, and other metadata and the free text entry.
- This knowledge of error classes makes it possible to forward defective equipment directly to specialised service staff and thus initiate repairs more quickly. Meanwhile, spare parts can be ordered from the service department even before the device is received.
- This probability prediction for the error classes in question can also already enable the case to be accelerated in complicated cases.

PROJECT STATUS

The model is currently not yet in productive use. The prototype achieves a rate of 80 per cent for the assignment of the most frequent error classes.

REQUIREMENTS

- The commissioner or service personnel must write texts describing the error condition for each service case. These should contain precise error symptoms, but should not anticipate the diagnosis.
- Defined error classes must exist.
- For each error class, at least 50 descriptions are needed for training the model. The fewer examples and the more error classes there are, the less precise the assignments become.
- The metadata such as device age or device type must be clearly linked to the faulty device.

AVAILABILITY

- Before an application, the model must be adapted to the tickets or the ticket system as well as device classes, error classes and so on.
- The service provider grandcentrix offers a framework that allows easy adaptation of the model to new ticket systems.

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SPECIFICATION

	Input data	Preprocessing	Data storage	Algorithms	Interfaces
High-level description	Service tickets with free-text error descriptions and all associated meta-data, esp. target error classes	Data cleansing and data preparation	Prepared data is archived according to the retention period	Classification and validation based on initial ticket information	Classification of free texts entries and meta data
Configurability	Data source	Description of the data format for completeness check	Lead time	Model parameters	Interface (access data)
Technical Implementation	Import source files in Excel format	Apache Airflow Data Pipeline	Azure Data Lake	Azure Machine Learning	API for feedback to the ticket system, web interface (Streamlit) for testing classification
Specific example from the speedboat project	Weekly import of new ticket data that triggers the start of the pipeline	Preparation of free texts for training, general check of data for completeness	Raw data and pre-processed data are stored in an Azure Data Lake	Assignment to defined error classes by estimation of the Wsk. Continuous training of the model with updated data, performance monitoring.	Scoring of Wsk via interface so that predictions are available in ticket system

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