

SMARTINSUR: A Platform for Digitizing Business Transactions in the Insurance Industry

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Abstract: For the digitization of business processes in insurance, the concept of a platform is presented that is based on the design principles of modern software architectures (domain-driven design, micro services). This raises the question of whether the complex application scenario can be realized with this software development approach and whether the advantages of agile development come into play. The complex interplay of the different roles involved in the processes, namely insurance companies, sales organizations and brokers, is illustrated using the example of a document service. The advantages resulting from the digitization of the example process, such as labor and cost savings, but also quality improvement and increased customer satisfaction are worked out. In the near future, process events will be recorded via the integration of a process mining service that can be of great help for further process optimization.

1 INTRODUCTION

Like all sectors of the economy, the insurance industry is forced to face the digital transformation in order to remain competitive. The implementation of digital business models is essential for insurance companies, sales organizations and broker pools in order to operate successfully in a rapidly changing and flexible environment in the near future.

Smart InsurTech AG (SmIT) has set itself the goal of digitally supporting this transformation process by providing a cloud-based B2B platform (Parker et al., 2017), (Ingeno, 2018), (Fowler, 2002). The SmartInsur platform represents the current technological approach to digitally support time-consuming and labor-intensive business processes in the insurance industry and to outsource individual functionalities from the old monolithic systems, which were used by the former individual companies from which SmIT emerged.

The focus of this paper is the question whether the complex application scenario can be realized with the help of modern software technologies such as DevOps (Kim et al., 2016), micro services (Newman, 2015), (Richardson, 2018), containerization (Liebel, 2019) and whether the advantages of agile development (Beck and Fowler, 2000), (Beck and

Andres, 2004), (Martin, 2008) prove their worth. In addition, the benefit that results from this new kind of system approach is described. This benefit is illustrated using the implementation of a business transaction service (GeVo service).

2 PROCESSES IN THE INSURANCE INDUSTRY

Processes in the insurance industry are characterized by great diversity and complexity, connecting a wide variety of business partners in different roles.

In order to better describe these processes and make them more usable for digitization, various players have already come together in 2006 to form BiPRO e.V. (German branch institute for process optimization in the insurance sector). Within this association, both insurance and brokerage companies and service providers work on information technology standards in order to standardize cross-company processes in the insurance industry and to describe them in the form of norms (BiPRO, 2015). The current BiPRO release 2 is divided into the business areas of search, transmission, inventory, tariff/offer/application (in German: TAA) and risk data. There are also general standards for

authentication and other so-called specific services, e.g. for external navigation in insurance portals. The GeVo service (acronym for German word “GeschäftsVorfall”, in English “business case”) described in the following chapter is based on the BiPRO 430 standard.

3 GeVo SERVICE AS APPLICATION SCENARIO

The so-called GeVo service, hereinafter also referred to as “Smart GeVo”, is currently being implemented as the first application scenario of the SmartInsur platform.

The starting point of the service is as follows: The insurance company (IC) has sovereignty over the contracts. Only the information that is marked as consistent information by the IC is actually part of the insurance contract of the customer. This information with the specified conditions is manually entered into the systems of insurance sales organizations and brokers, in this paper called broker management software (BMS). Corresponding documents attached to the insurance information are also stored there.

Since the manual entry of the delivered quantity of documents is very difficult to handle and errors always occur, the data quality in the BMS system is not sufficient to be able to fully automate valid follow-up processes on the sales organisation/broker side. This means that only a small part of processes such as commission settlement and the delivery of information to the policy holder can be done in a semi-automatic way.

Smart GeVo aims to automate the transfer of the information provided by the insurance company with

the appropriate classification and analysis into the BMS systems.

Within the GeVo service, documents from three different input sources are processed and – were appropriate - are enriched with relevant additional information.

The workflow of the GeVo service was developed in a two-day workshop using the Event Storming method (Brandolini, 2019), (Avanscoperta S.r.l., 2019), see figure 1. In collaboration between domain experts and software developers, a common visual model of the application domain was developed. The complete GeVo process was modelled from start to end on a high level of abstraction divided into individual contexts and visualized in a so-called context map (Evans, 2003).

The GeVo-Service provides a solution that can receive documents from the following sources of an insurance company (see figure 2):

- BiPRO call: The platform permanently picks up all BiPRO 430 deliveries from insurance companies and makes them available for the BMS systems connected to the platform.
- Broker Extranet: The IC extranets for sales organizations and brokers are continuously searched for documents. To generate a BiPRO delivery (shipment) from relevant documents residing in the extranet, meta data are required. These meta data are generated by the BiPRO provider context. The BiPRO provider context communicates with a data preparation context which reads and analyses the documents using special scan software with AI technology (Iblich GmbH, 2019). The complex document structures are analysed and evaluated, so that they can be assigned optimally to the BMS systems for further processing.



Figure 1: First Vision of GeVo Service created by Event Storming Method.

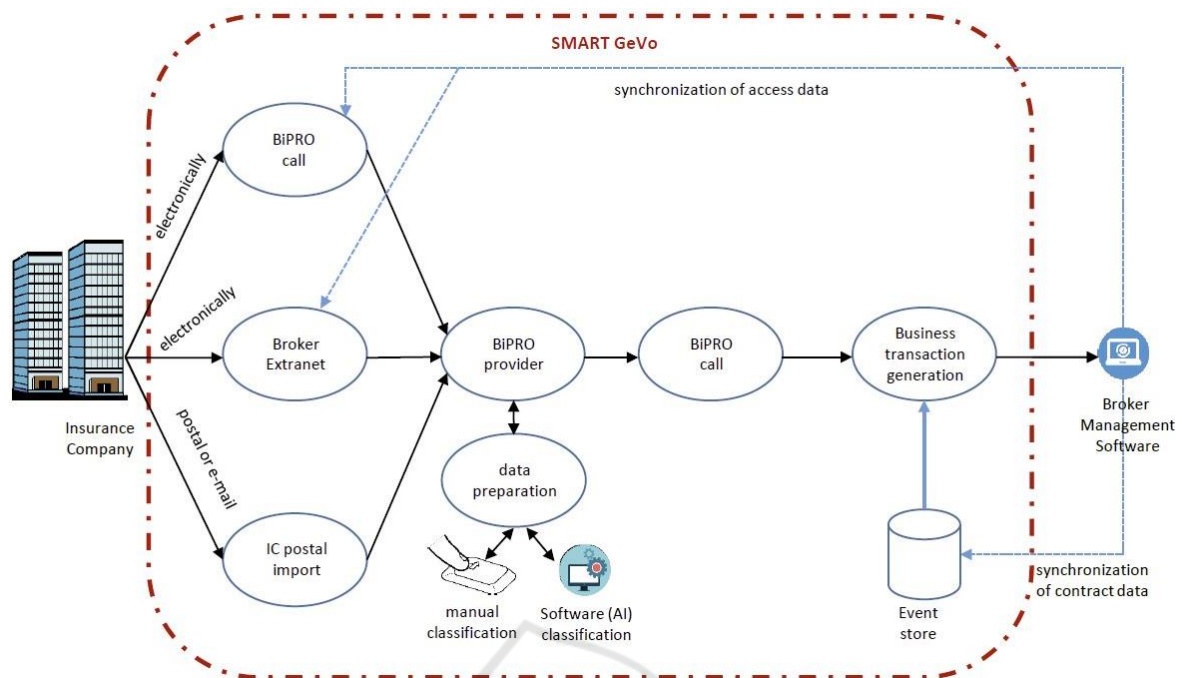


Figure 2: Overall View of Smart GeVo Application Scenario.

- Manual document feed: Documents delivered by letter or e-mail can be handed over, for example, via an app to the BiPRO provider context. As with documents from the IC extranets, corresponding meta data are then extracted using the above mentioned scan engine which hopefully delivers relevant information like e.g. insurance company, the insurance category, contract number, customer name, document subject etc.

If the data quality is sufficiently good, it will be passed in a BiPRO-compliant style with the above-mentioned meta data and the type of business transaction (change of address, change of contribution, damage report etc.) to the next context, the business transaction generation service.

If the quality of the data and the corresponding documents is not sufficient and if the meta data cannot be extracted by the data preparation context, a manual classification has to be done by the back-office of the sales organizations and brokers, before the information is passed to the business transaction generation service.

The access of sales organizations and brokers to fetch BiPRO documents or to read information from the extranets is periodically synchronized by the BMS systems or manually granted via an API. BiPRO calls and documents from the extranet are regularly called up in an automatic way after the broker's access data have been stored; then the BiPRO documents are

imported or the shipments are processed as described above.

In the business transaction generation context, the data of the connected broker management software are searched for the correct mapping of the business transaction. A policy number mapping algorithm correctly assigns the documents to the respective sales organizations resp. broker of the connected BMS systems.

In order to find the ID of the contract within the BMS system, the important information (insurance company, insurance division, contract number) must be synchronized with the platform. This is done via an event store (Vernon, 2013), (Richardson, 2019), to which new signings of contracts and contract changes are transferred to provide latest information to the business transaction generation service.

If the transaction generation service now receives information about a new event of this type, this information is also used for the search within the document assignment step. Based on the information from the insurance company and the insurance division, a search contract number is generated, which is then used for the assignment. If the contract has been clearly identified, the data (e.g. start of contract, contract expiry, premiums etc.) and the document are forwarded to the BMS for final storage and further processing.

However, if an exact assignment can not be found, the document with the associated data is made

available in an inbox of the BMS for manual processing. All manual interventions by a user, whether manual classification or manual processing of the supplied data and the document, are saved and analyzed with the assignment result in order to continuously improve the performance of the service.

As part of the overall integration, it is now possible to start follow-up processes such as e.g. the creation of a resubmission in the connected broker management software.

All communication between the different services as well as key figures relating to the assignment and quality of the data are stored for later analysis. The evaluation is carried out using various tools such as Graylog (Graylog, 2016) or Kibana (Kibana, 2015), which provide important insights on the data for further process improvement.

The main benefit of the overall scenario is that the user receives all documents and business transactions via the platform's GeVo service, regardless of the sources from which this data originate. According to the sales organizations and brokers of the connected BMS systems, a large part of the documents is still not delivered via BiPRO format. For this reason, the GeVo service enables a much better data quality according to BiPRO format and extensive automation of the previously manual processing. Thus, the sales organizations and brokers save expensive manual back office activities at this point.

The GeVo service has already been tested by selected beta testers and will be launched as first application scenario of the SmartInsur platform by the end of first quarter 2020.

4 FUTURE STEPS

The SmartInsur platform was designed and developed according to the methodology of domain-driven design (DDD), (Evans, 2003), (Vernon, 2013), (Vernon, 2016). The focus is on the complex business processes of an application domain and the close cooperation between software developers and domain experts. In addition to the definition of a uniform language (ubiquitous language) and delimited technical aspects (bounded contexts), DDD offers strategic design patterns for implementing the concepts in the form of a microservices architecture (Richardson, 2018), (Newman, 2015).

Within this design concept, the integration of new contexts with corresponding new functionality is straightforward.

The next step in the enhancement of the platform is the integration of a process mining service. In order

to be able to carry out an evaluation of the processes and an analysis of the activities and supplied document information regarding insurance companies as well as sales organizations and broker pools, all corresponding process data will be collected in the process mining service and evaluated using process mining techniques (van der Aalst, 2016), (IEEE, 2019). By that, the complex application scenario can be analyzed from three different perspectives, namely the insurance companies, the sales organizations resp. brokers and the clients. Many interesting questions can then be answered, e.g.

- What is the overall number of business transactions per day/month/year?
- What is the number of business transactions per sales organization or broker?
- What is the number of business transactions per sales organization or broker per insurance category? Answering this question will yield hints for underused potentials.
- What is the average throughput time of a business transaction?
- What is the number of manual activities per business transaction?
- What is the overall number of fully automated assignment of documents?
- What is the number of fully automated assignment of documents per insurance company? This performance indicator can be used as a benchmark for classification.
- etc.

Another enhancement of the platform is the support of other business cases by the provision of public APIs. An example is the delivery of single documents by the insurance company, where the context BiPRO provider extracts relevant information for further consumers according to BiPRO norm.

5 CONCLUSIONS

The SmartInsur platform as a technological basis supports the necessary agility and flexibility of business processes in the insurance environment and guarantees seamless integration of all involved actors (customers, sales organizations, brokers, insurance companies). The monetary advantage for insurance companies, sales organizations and brokers as users of the platform results from the high degree of automation of the business transactions and the resulting optimized throughput times with savings on expensive back office activities. A further advantage for insurance companies and brokers results from the

fact that the transaction costs can be allocated according to the originators of the business transactions and the corresponding efforts.

The future process mining service offers the platform operator enormous potential in analyzing and evaluating the process data of the business transactions. These process data can be used, for example, to provide new insurance companies and/or brokers with best practice procedures or to make existing platform customers aware of weaknesses in their processes.

From a technological point of view, the methodology of domain-driven design (DDD), the implementation of the SmartInsur platform as a micro services architecture and the agile development process using Scrum (Sutherland, 2014) have shown more than practicable for the complex application scenario. We believe that the combination of these methodologies was the only feasible way to realize a first version of the completely new platform in the short time period of less than a year. We also believe, that this technological approach guarantees easy extensibility and flexibility for the operation and future enhancement of the SmartInsur platform.

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