Project Description

The RegCheck project tests an innovative knowledge management system to document supply and demand between evidence-providing and evidence-requesting public sector entities in Germany.

To accomplish such, data fields of prototypical evidence data ("*Reifegrad D1*") from the German residents' register as well as requirements for single evidence data for the public sector of Germany will be identified and connected.

Compared to other projects within the German registry modernization, RegCheck is set in a scientific environment that is characterized by methodological approaches with its main deliverables being analyses and studies. In a semi-laboratory setting, a proof of concept for a knowledge management system will be created. A proof of concept for a knowledge management system using Semantic Web Technology is being created under essentially laboratory conditions. The knowledge management system is tailored to the scenario of determining which data from the residents' registration system is needed for specific public services.

One of the project's intended deliverables is a context analysis that compares RegCheck to other projects in registry modernization, like *XNachweis*[1], XEvidenceSurvey[2], "*Fachdatenkonzept*"[3], "*Registerlandkarte*"[4] and "DESTATIS VIP"[5]. Furthermore, multiple studies will be conducted and written about various topics such as: "experiences from ontology-based federal coordination processes", "the utilization potential of AI (artificial intelligence)" and "the potential of Semantic Web technology for the registry modernization". These will complement the scientific perspective with a practical view throughout the project.

The main deliverable of RegCheck however, will be the knowledge graph "*Deutsche Verwaltung Registermodernisierung hier: Meldewesen*" (German public sector register modernization: resident register)

The knowledge graph, based on the EU Core Vocabularies CCCEV (Core Criterion and Evidence Vocabulary) and CPSV (Core Public Service Vocabulary), will represent the relationship between evidence requirements of data fields ("*Reifegrad D1*"[6]) within public sector processes and providing required evidence in the resident register.

To realize the previously mentioned representation in the residents' register, RegCheck will make use the already standardized data fields from "*DSMeld*" (Data Set for residents' register

[1] A XML-standards for data tranfer in the German public administration.
[2] A XML-standards for data tranfer in the German public administration.
[3] A data concept for the register modernization. It is currently in development.
[4] An overview over existing registers in the German public administration.
[5] An overview over the meta data located in different registers of the German public administration.
[6] Highest aspired level of digitalisation in the data retrieval of the German public administration. It enables the transmission of specific contents and data points of a data register compared to the transmission of a whole record.

systems on federal and state level). The knowledge graph will be validated by making use of the EU interoperability test bed.

To gain empirical information about data fields, in-depth interviews with public sector employees will be held. The aim is to find out which information of data fields is classified as necessary for a public sector process. This "implicit knowledge" will be incorporated when modelling the knowledge graph.

Against this background, the following use case scenarios for the knowledge graph are feasible:

1. **Redesigning and amending applications, evidence and legal texts**

   1.1. *Redesigning evidence in connection with ID number (identification number)*

   A Public sector employee wants to adjust existing evidence or create new evidence (e.g., enrolment certificate). They use the knowledge management system (knowledge graph) to look up which data fields are necessary (e.g., academic institution). The knowledge graph determines which data fields from which evidence-providing entity are required for which public sector services.

   1.2. *RegCheck as a support system for redesigning applications*

   A citizen normally submits evidence in connection with its application to an authority. The knowledge graph can be used in redesigning applications, for example in connection with an ID number.

   1.3. *RegCheck supports with creating laws*

   During the legislative process, the knowledge graph can be used as an information system by the legist.

   1.4. *RegCheck supports evidence queries*

   In a later expansion stage, once many provider data sources are recorded, RegCheck can be used by a future data consumer to design queries, e.g., to "*NOOTS*"[7].

   1.5. *RegCheck supports FIM (Federal Information Management)*[8]

   Redundancies in FIM become visible through the knowledge graph, which builds on the harmonisation, as it is easier to access and find redundancies. The federal XML standards and FIM can be considered.

The target group would be expanded beyond public sector processing, accelerating the FIM standardization initiative. As such, RegCheck supports the Institute for Legal Studies and the prospective establishment of the Legal Tech Innovation Hub.

[7] **N**ational-**O**nce-**O**nly-**T**echnical-**S**ystem: A planned technical solution to connect German public administration registers.
[8] The **F**ederal **I**nformation **M**anagement (FIM) is a project of the German IT Planning Council. It aims to harmonise information on administrative processes between the federal government, federal states and local authorities.

2. Wallet

The wallet is a collection point for electronic evidence. RegCheck describes out of which data fields evidence is composed, making it possible to identify mandatory fields and create grouping options through logical relationships.

The user grants access to data fields of evidence. The wallet knows which evidence data is needed for each request. The user can be guided in granting access to individual evidence content of the wallet: which information the user must release for which use case, which information they can optionally provide, and which mandatory information from the evidence must not be withheld from the online service.

3. Secondary use case scenario: standardizing AI output through the knowledge graph:

Potential AI applications such as Large Language Models (LLMs) can become more accurate using knowledge graphs, thereby reducing its hallucinations (inventing or misgrouping).

4. Secondary use case scenario: knowledge management:

The knowledge graph can be used as a knowledge management system, e.g. by sharing specialized knowledge that is documented in the knowledge graph between employees in different public sector authorities.

In addition to the knowledge graph, the RegCheck project will produce action recommendations for future similar projects. For example, the potential of AI and the importance of semantic interoperability in the registry modernization will be analysed and evaluated.

Contact:

The project is being organised under the lead of the Thuringian Ministry of Finance (TFM).

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