

# Collaborative Problem Solving for Regional Development? – A New Approach of Public Participation

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**Abstract.** In this paper, we present a concept prototype for a socio-technical assistant (s.TAS) as a collaborative problem-solving approach to support the regional development in a selected rural district. The presented concept considers insides from citizen participation as an open government instrument and strongly incorporates collaborative value creation to address regional development issues. The presented approach incorporates citizens and other regional stakeholders (e.g., companies, organizations, associations) as problem-solvers and strongly enables regional stakeholders and the public administration to develop solutions jointly as an ongoing learning process. In this sense, s.TAS addresses participation approaches and elaborates participation to collaboration. For the development of this participatory problem-solving approach, we conducted (1) a broad literature review on participatory approaches and (2) we implemented a qualitative, collaborative research approach with participants from different stakeholder groups. In several workshop rounds, supported by interviews and surveys we developed a concept prototype for the socio-technical assistant s.TAS, which is a technical, smart system, which supports information, communication, participation and collaboration in the selected region.

**Keywords.** Participatory approach, socio-technical assistant, open government, regional development, collaboration

## 1. Motivation

This paper presents an ongoing research project about the development of a collaborative problem-solving tool, which should support rural areas, regions or communities to deal with challenges provoked by the demographic change and its consequences for rural areas. The research project is conducted collaboratively with a selected rural district in Germany, research institutions, companies and citizens.

“Demographic change in Germany is marked by low birth rates and a declining population size. Increased life expectancy, the resulting ageing of the population and the growing proportion of the population with an immigrant background affect Germany more than other industrial countries. Demographic change impacts almost every area of life and will significantly influence our society and economy in the coming decades.”[1]

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With regard to demographic change, we very often problematize higher costs in terms of care and mobility, the necessity of technical assistant systems to compensate physical detracting, the (social) isolation of rural areas and the overpopulation of urban cities. In our research, we address the aging society with its professional and life experiences as a chance and potential to participate in the solution of demographic change induced challenges. We address a generation of elderly people, who are longer in good health conditions, active and already experienced with technical systems. From our perspective, this generation is able and willing to participate in a collaborative development of the region they live in by using a socio-technical assistant. Furthermore, we aim to introduce a participatory instrument, which supports collaborative problem solving, which is not limited to information delivery or communication tools for public administrations only.

## 2. Theoretical Considerations

In order to explore new instruments of participation and collaborative problem-solving approaches a common understanding of open government, and public participation as an open government instrument is necessary. The term “open government” contains a variety of nuances of meanings [2]. Open government is used as synonym for open data (see IT-Planungsrat 2010), other authors rather link open government to open innovation (Noveck 2011) or emphasize citizen participation (Bauer/Seckelmann 2012) or a comprehensive integration of all societal stakeholders (Krabina/Lutz/Prorok 2012) [2]. Other sources link the “open government” movement to the memorandum of the US-President Barack Obama (McDermott, 2010) [3], who defines in the memorandum in 2009 open government as a triad of transparency, participation and collaboration [4]. In our research, we follow this understanding of open government in terms of transparency, participation and collaboration. In this sense, transparency includes the delivery of data and public operations, while participation and collaboration address the integration of citizens in decision-making and service provision processes of the public administration [5]. Through this, on the one hand, the public administration operations are legitimized; on the other hand, information, knowledge and citizens competencies are incorporated into the administration.

### 2.1. Citizen Participation as an Open Government Instrument

The participation of citizens allows partaking in political decision-making processes in several forms and on different political levels. The instruments of citizen participation have been developed continuously over the last years. Beside rather traditional instruments, which are incorporated in administrative proceedings or building legislations and obligatory, a variety of new facultative participatory instruments can be implemented [6]. Two forms of citizen participation can be distinguished: (1) direct-democratic and (2) deliberative forms of citizen participation. In terms of direct-democratic forms of participations, citizens vote directly for or against certain issues. In terms of deliberative forms of participation, citizens participate by exchange of arguments in discussions. Citizen participations are also characterized by the elements information, communication, and participation and consulting. Nowadays, there is a variety of different citizen participation instruments (e.g., wikis, scenario workshops, forums, open space conferences, bar camps, deliberative polling, citizens' panels, citi-

zens' jury), with different aims, number and kind of participants, duration, costs, expected outcomes and not every instrument suits certain issues and conditions. Each citizen participatory instrument must be chosen carefully due to the intended aims, costs and benefits [7]. Nevertheless, there are obstacles to overcome when it comes to proper implementation of citizen participation on a regular basis. Opinions, arguments and participations of citizens have to be taken seriously and there is a need for proper conflict moderation. Following decisions need to be transparent and comprehensible, especially in terms of contrary decisions. The value of citizen participation for public administrations and politics is obvious; decisions are legitimized and information can be delivered in an appropriate way. If public administration take citizens seriously, positive image effects for the public administration can be a consequence [8]. To sum it up, the discussion of citizen participation instruments indicates that information, communication and participation are key elements of existing participatory instruments while the problem-solving itself by citizens is not in the centre of participatory instruments. There is a need for collaborative problem-solving approaches, which allow a joint development of solutions by all stakeholder groups as well as the implementation of solutions. Furthermore, in our approach problem-solving is an ongoing process or cycle rather than a selective implementation of individual participatory instruments.

### *2.2 Technical Assistant Systems for Problem Solving*

Technical Assistant Systems as a human-technical interaction approach, with interdependent effects of technical processes and social behavior [9], are still addressed as future issues, which needs to be further explored [10]. In some learning, working and living environments, assistant systems are already implemented, e.g., in the area of welfare-technologies [10], in terms of systems for the preservation of qualifications and competencies of employees [11], systems for driver assistance or systems for decisions making support, and the development of alternatives [12]. The status of marketability and implementation differs significantly between the different areas of application. While driver assistance is widely accepted, welfare technologies are still confronted by a low level of marketability [10]. In our study, we address a technical assistant system, which should not be focusing on the support of individuals or organizations, like driver assistance. The system aims to support the solving of comprehensive, societal problems with regard to demographic change on the level of regions.

## **3. Object of Investigation**

In order to further explore new participatory approaches, the role of citizens and their ability to solve regional development problems collaboratively with the public administration and other regional stakeholders (e.g., companies in the regions, non-profit and private organizations), we address a rural district in Germany confronted with specific regional development problems. The selected district with 160.000 inhabitants is highly affected by demographic change and its consequences, like an aging society with 43.2% of inhabitants over the age of 50 [13], the isolation of rural areas, corresponding new requirements for infrastructure, mobility concepts and logistics. On the other hand, the selected region also encompasses "hot spot areas" characterized by a significant growth in terms of society and economic development with a high demand for a skilled workforce, living spaces and other needs of infrastructure. Overall, there

are several burning issues to address and to solve by the affected stakeholder groups and a need for collaborative problem-solving approaches.

#### **4. Methodological Approach**

For the development of a participatory problem-solving approach, we conducted (1) a broad literature review on participatory approaches and (2) we implemented a qualitative, collaborative research approach with participants from different stakeholder groups. In several workshop rounds, supported by interviews and surveys we developed a concept prototype for a socio-technical assistant (s.TAS), which enables and supports citizens to solve regional development problems collaboratively with the public administration and other regional stakeholders. In this iterative process, we included two research institutes, representatives from the public administration, citizens as well as companies and organizations with different perspectives on the topic. During idea workshop rounds, we involved 29 people (17 from the rural district administration; two persons as city representatives; 5 company partners with technical background and 5 members from the responsible research group). We implemented creativity techniques, design thinking [14], [15] and other user centric approaches for the generation and assessment of ideas for the development of a participatory tool. The aim of the workshop rounds was to explore requirements and use cases for a new problem-solving approach. For this purpose, we introduced and explored different personas (user-centric approach) and the workshop participants developed jointly ideas to deal with the persona's circumstances and requirements.

The idea generation was supported by key questions in order to trigger and to guide the idea generation during several brainstorming sessions. Sub-groups collected 147 rough ideas by answering several key questions: e.g. "Which issues has s.TAS to address in order to encourage persona 1 to participate enthused?" or "What has s.TAS to address in order to make Persona 2 telling his friends about s.TAS?" or "How can the public administration supported by s.TAS help Persona 2 to develop leisure facilities in his home town?" or "How can s.TAS support Persona 3 to develop a small and desolated village into a mobility hot spot with attractive new transport solutions?"

In further rounds, the workshop participants and the facilitator clustered, evaluated and consolidated the outcome of the idea generation. As a key result, the discussion was centered around three main topics for s.TAS. (1) easy handling, (2) contact, information and participation and (3) rules. A multitude of participants emphasized the need for an easy-to-use intuitive approach for s.TAS. Under this point, the participants discussed certain requirements like multilingualism, easy access possibilities via internet, mobile devices and other forms like terminals in appropriate areas. Furthermore, participants emphasized the necessity for s.TAS to act as a contact and knowledge broker. In this sense, s.TAS should deliver information, provide solutions, and enhance citizen participation and joint problem solving. Workshop participants also agreed that s.TAS has to have rules. For example, the users of the system should have profiles, clearly indicating the competencies, skills or experiences of the user with explicit rights to read and write or administrate. In another workshop round the s.TAS system was roughly sketched by the involved participants. In that way, first ideas for its technical implementation could be collected and discussed as a fundament for the development of a first concept prototype.

## **5. New Problem-Solving Approach with s.TAS**

In this section, we present the derived conceptual prototype and the key functions of a socio-technical assistant (s.TAS) for collaborative problem solving. S.TAS is conceptualized as an action system, in which different human and technical subsystems are integrated comprehensively [16]. In general, s.TAS is a technical, smart system, which supports information, communication, participation and collaboration in the selected region. Furthermore, s.TAS is supported by “face-to-face” participatory instruments with linkages to the technical system and vice versa. s.TAS is open for all stakeholder groups and has to meet the needs for several stakeholders (“design for all”) in terms of accessibility and usability. s.TAS will be supported by an internet website, mobile applications via smartphone or tablet, but s.TAS should be also available on an appropriate terminal in public areas. s.TAS allows three key functions (1) information and communication platform, (2) participation and (3) collaboration.

As an information and communication platform, s.TAS allows the public administration to present information in an appropriate way; citizens, companies, and other stakeholder groups receive information; questions and answers; ongoing discussions will be supported as well.

As a participation assistant s.TAS will coordinate participatory processes and moderate collaborative approaches between different stakeholder groups. In terms of collaboration s.TAS allows the joint development and implementation of solutions between relevant stakeholder groups. A key element within the s.TAS approach is the learning, dynamic knowledge base (see figure 1), which contains data and information (statistics, videos, data etc.). Furthermore, knowledge regarding certain issues, best practice solutions or any problem-solving information will be contained as well. In this sense, the system learns continually. This knowledge is based on the knowledge of all stakeholder groups who are willing to support and enrich a certain issue. Solutions can be delivered by experts (public administration, companies, and research institutions) but also by laypersons with creative input. Each stakeholder has its own profile and competencies. Supported by a messenger system, stakeholders receive enquiries or invitations to participate in the problem-solving process.

For each problem-solving process, a task force is formed and moderated. This procedure allows to collect and present necessary information for a certain problem-solving process and it allows to bring together an appropriate set of people as a task force. The problem-solving process itself will be supported by the s.TAS but also by offline instruments.

The technical system provides tools for orchestrating the collaboration process as well as for editing and managing the various kinds of artefacts arising out of the solution-finding process, like sketches, text documents, tables, technical specifications, audio or video files, mathematical models, construction plans etc. s.TAS will also provide methods for a collaborative evaluation of contributions and (partial) solutions by means of innovative interactive visualization techniques as well as collaborative virtual and augmented reality technologies. Generated solutions will be implemented in the real world and the developed solutions will enrich the knowledge base for similar or related issues.

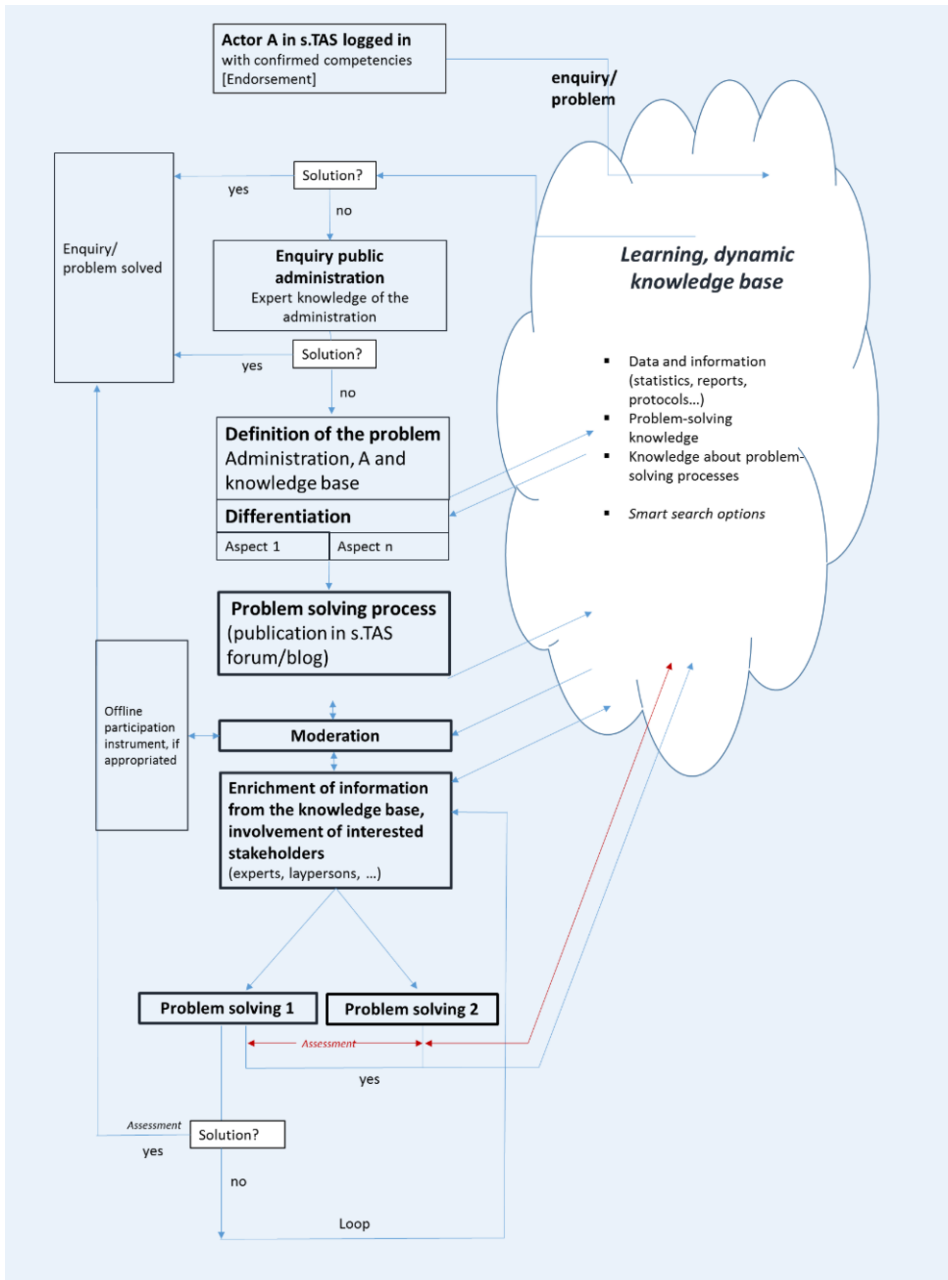


Figure 1. Concept Prototype

## 6. Conclusion and Further Research

In this paper, we present a concept prototype for a socio-technical assistant as a collaborative problem-solving approach to support the regional development in a se-

lected rural district. The concept considers insights from citizen participation as an open government instrument and strongly incorporates collaborative value creation to address regional development issues. This approach incorporates citizens and other regional stakeholders (e.g., companies, organizations, associations) as problem-solvers and strongly enables regional stakeholders and the public administration to develop solutions jointly as an ongoing learning process. In this sense, the approach addresses participation approaches and elaborates participation to collaboration. In this paper, we shortly present key results of ongoing research, which has to be deliberated further in the future. Future research will emphasize several research questions. Firstly, we have to explore how stakeholders can be motivated to contribute in the problem-solving process. Secondly, we have to consider possible barriers within the public administration and corresponding measure to address and conquer identified barriers. Thirdly, we have to design a development process, which allows regional stakeholders to accompany the technical development of s.TAS in a systematic way in order to ensure implementation and usage.

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