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OVERVIEW OF AUTOMATED DECISION-MAKING LANDSCAPE IN THE ITALIAN WELFARE SYSTEM

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DESK RESERACH ITALY

EXECUTIVE SUMMARY

This report aims to give a first national overview of automated decision-making systems - ADM - adopted in the public sector in Italy. In the first part of the report it is intended to take a look at what method was adopted for the research and the context in which this research was conducted. Then, in the second part of the report, an attempt was made to highlight where ADM cases have been implemented in the Italian public administration, focusing on welfare sectors (core welfare sector) and municipal sectors (smart city projects). The aim is to give a framing in descriptive terms of the Italian situation in general. Finally, in the last part, four potential case studies, inherent to the field, are described, attempting to detect the potential ADM systems in use or in the making and their possible critical points.

1. *Method and source*

As an entry point for the desk research, a wider perspective was considered to illustrate several different ADM systems adopted in Italy in public sectors at large starting from the automation in the public administrations and focusing on the two project domains: core welfare services and communal welfare infrastructures.

Following the literature review on ADM (Allhutter et al. 2020, Dencik and Kaun 2020, Kennedy 2018, Sztandar-Sztanderska & Zielenska 2018) and the concept and objectives of the project, two dimensions were considered crucial for the desk research automation (ADM and semi-ADM systems implemented or underway for implementation) and social scale.

The process and procedures for the desk research were mostly by website navigation using keywords and navigation through the official institutional websites, which were first liked and catalogue in the following file at https://speicherwolke.uni-leipzig.de/index.php/f/251427290, and as a second step thought a spreadsheet in the following file at https://speicherwolke.uni-leipzig.de/index.php/f/251506190 where information was collected and sorted it into tables, including the following categories:

- Actor
- Project (Project title or similar)

- Date (date of project implementation)
- ADM system
- Welfare sector/communal welfare infrastructures
- Project description (short description of the project, including a sentence from the project presentation)
- Link to the website
- Link to the project (including a link to the attached pdf or similar)
- Strategies document on digitalisation
- EU-funded projects' reports, programmes, evaluations, and action plans.

2. Overview of the situation in Italy

2.1 Automation of Public Administration

The majority of the algorithms found on public administration are catalogue in the Observatory for Automated Public Administrations (Osservatorio Amministrazione Automatizzata) created and sorted by the **Associazione Privacy Network** based in Milan, a group of young people, where some of them are PhD students of the University of Milano, and others are a group of lawyers concerned mostly with the technical part of the datafication of society.

The algorithms listed here are mostly tracking and predictive algorithms such as facial recognition like **Seamless Flow** for identification and control in the airport or as **SARI** from the Ministry of Internal, that captures and processes biometric (physiological scanning) data. The tax offices (Agenzie delle entrate) have introduced, since 2012, many instruments to check for tax evasion automatically through the ISA Fiscal Reliability Index and assessment of the tax reliability level. The idea behind the **ISA** is to revolutionise the logic of fiscal compliance, shifting from a 'punitive' approach to one that is based on 'rewards' for those who have consistently shown fiscal reliability, according to the index. As a result, taxpayers with higher scores will enjoy a reward system that includes exclusion from certain fiscal inspections and simpler conditions for compliance. Among them is the search for discrepancies between someone's stated income and her/his actual spending patterns ("Redditometro") or between declared invoices and standard of living ("Spesometro"). In addition, the forthcoming "Risparmiometro", will try to automatically recognise anomalies between stated income, savings and standard of living by matching information from several databases. One of the oldest algorithms is Delia introduced in 2008 from the state Police **Delia** and **KeyCrime** which are predictive policing, Delia is one of the most advanced software in crime analysis. In Italy, the trial was conducted by the State Police in Milan. Universities during the Covid-19 pandemic have introduced **Respondus** a software proctoring for remote control of the student's device, and video data analysis in real-time via webcam, on the other side the Ministry of Education MIUR has introduced the **Graduatoria GPS** an algorithm for substitute teaching assignments and GPS, Lazio Region, primary, nursery and secondary schools and it is an automated system for the assignment of substitute teaching assignment introduced for the 2021/2022 school year.

Another survey was conducted by FPA (Forum Pubblica Amministrazione) in 2021 and, which was carried out through a panel of 80 public managers in six PA IT sectors between central PACs and territorial realities of the National Health System (NHS). We have 40 managers from the central

government administration and 40 from the territorial and national health systems. From the survey, automation results as a significant topic in public administration, especially for simplifying internal workflows. This is justified for the improvement of the processes of citizens' services. And this is done by purchasing the service via external suppliers so through outsourcing. And to do this they need to develop skills and capacities for governance for developing, managing and controlling the relations with suppliers.

In the same year in 2021, FPA Digital 360 also conducted a survey on the digital maturity of municipalities. From a territorial perspective, the North and Centre are the most digitalised and from a population dimension, big cities with a population of over 240,000 inhabitants have a better level of digitalisation.

2.2 Core welfare services

SIU: Is an ICT system that is being integrated with other public offices for better coordination and circulation of the information and profiling of jobseekers, meaning better-targeted measures, better matching of vacancies and jobs and data-supported decision-making of the public employment services.

Gol: Is a Regional program that started to function following the national quantitative profiling model to target measures under the Youth Guarantee launched in 2015. The GOL programme has so far acquired 198,000 dossiers of the same number of RdC beneficiaries to accompany them on the labour market through insertion and skills upgrading paths. For another 47 thousand, training activities have been started. Under the 'new course', minors aged 16 and over who have fulfilled their school obligations will also be obliged to participate actively and undergo training if they are not already in education.

These two systems rely on the assumption that the application of a suitable job offer is set to be dependent on the new ICT systems for providing employment services and that these systems are considered effective, cost-efficient and customer satisfaction.

Aim: to integrate the highly fragmented division of responsibilities for employment services in Italy over the past decades which has led to an abundance of IT systems and databases on provincial and regional levels.

From the Report of OECD: "*a well-functioning and supportive infrastructure is considered as an integral part of a modern public employment service, the backbone for the tasks that it performs*[1].

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[1] Report of OECD, *Active Labour Market Policies in Italy*, 2019, p. 111.

This system should serve as the basis for monitoring the activities and effectiveness of the Regions and the CPIs allowing the introduction of performance management in the system.

It will also have functionalities to exchange data with other organisations, such as providing data on activation conditionality on benefit recipients to INPS and receiving data about the job seekers from the databases concerning education information, income and income tax returns data, land and real estate data. Data exchange is also envisaged with INAPP to enable it to evaluate training activities and active labour market policies.

When fully implemented, the administrative burden in the CPIs should be reduced significantly, for example, when it will become possible to exchange data about unemployment status with other organisations. Hence, effectiveness, efficiency and customer satisfaction should be significantly increased when the IT development plans will be fully realised.

Moreover, this is in line with what the Jobs Act specifies that the employment offices have to use the online system to communicate violations of activation activities by jobseekers to ANPAL and INPS which execute the resulting benefit adjustments. ICT systems that are taken as models of good practices are the performance management systems in Estonia and Austria.

Social Services SIUSS and SIOSS: The legislative decree of 15 September 2017, no. 147 on 'Provisions for the introduction of a national measure to combat poverty', in establishing, in Article 24, the Sistema Informativo Unitario dei Servizi Sociali (SIUSS), provided for articulation into two components: the Social Benefits and Needs Information System, which integrates and replaces the Assistance Register and is managed by INPS, and the newly established Social Services Supply Information System (SIOSS), whose data are collected, stored and managed by the Ministry of Labour and Social Policies and are transmitted by the Ambiti Territoriali, also through the Regions and Autonomous Provinces.

The SIUSS, in its components, is structured to achieve precise purposes to ensure complete knowledge of the social needs and the services provided by the integrated system of interventions and social services. It provides all the information necessary for the planning, management, monitoring and evaluation of social policies to monitor compliance with the essential levels of services to strengthen the controls on unduly received services. Furthermore, it aims to have a unitary database functional to the planning and integrated design of interventions through the integration with the health information systems, labour and other areas of intervention that are relevant for social policies, as well as with the benefits management information systems that are already at the disposal of the municipalities process data for statistical, research and study purposes.
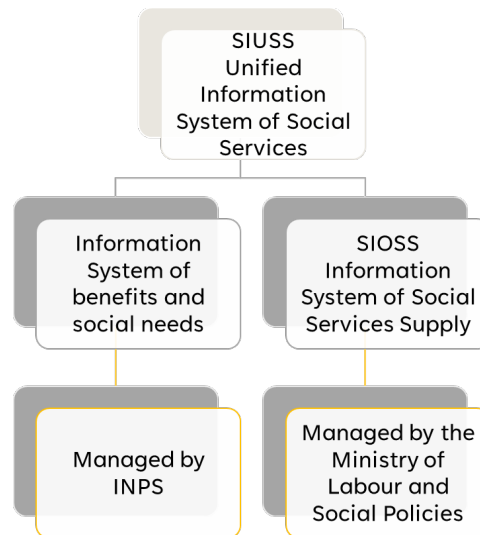
From the Basic Income Measure to MIA – Active Inclusive Measure: The Budget Law 2023 (*Legge di Bilancio*) has introduced a downsizing of the RdC (*Reddito di cittadinanza* – Basic Income Measure) which, starting from January 2023, will last eight months instead of the current 18 months, also introducing further constraints, such as the obligation to attend retraining courses for at least six months. The new version is under construction and is called MIA, which provides a new digital platform of the Ministry of Labour and Social Policies. An algorithm will guide the so-called 'poor' subjects in a pathway that includes:

- Compulsory training through a new mechanism of recruitment and activation by the CPI (Job Centres) through the GOL programme (already described in the previous section).
- The Digital Activation Pact: After defining the retraining or insertion pathway, the next step for would-be beneficiaries of the new MIA subsidy will be the Digital Activation Pact together with the Service Pact. In practice, MIA subsidy recipients will have to commit to fulfilling the training obligations required by law and accept the job offers they receive through the Job Centres. As provided for in the Budget Law 2023, job offers cannot be refused, under the penalty of forfeiting the subsidy and the retraining and work reintegration programme.

    A **digital platform** will manage the job offers, which will be considered congruous if they are in line with the person's profiling and located in the province of residence. 30-day contract offers are also admissible.

Public Health-Region Emilia Romagna: RiskER – predict the risk of hospitalization: "RiskER" is a statistical procedure that combines over 500 demographic and health variables in order to 'predict'

the risk of hospitalization. The automated system was developed by the Agenzia Sanitaria e Sociale (Health and Social Agency) of the Emilia-Romagna Region together with the Jefferson University of Philadelphia.

It has been used on an experimental basis in 25 "Case della Salute" (public offices where administrative, social and healthcare services are provided at a local level), involving some 16,000 citizens and 221 general practitioners. The aim is to change the hospitalisation process of patients who, according to the algorithm, show higher health risks. It is hoped that the system will eventually be used in all 81 "Case della Salute" in the Emilia-Romagna Region.

2.3   Communal Welfare Infrastructures

The municipalities of Genova, Monza, Roma, Trieste, Venezia, Perugia, Potenza, Brescia, and Milano are cities where are underway connected and automated systems of mobility and transport, real-time road user information to maxima the flow of traffic, also smart lights and also with other cities such as Trento, Bologna, Firenze and Milano that have developed strategies for smart cities such as Shared e-mobility (e-cars, e-bikes, e-logistic vehicles, charging points, smart parking), Sustainable energy management service, Urban sharing platform, Smart lamp posts, sustainable mobility and infrastructure innovation.

The main engine for the research funding is the EU programmes, such as Horizon, dedicated to "smart cities and communities".

The smart city discourse is placed in the most recent phase of the 'history of urban imaginaries' a phase that can be situated in the wake of the narratives of the sustainable city and of the informational/intelligent city.

"On the one hand, smart city policies support new ways of imagining, organizing and managing the city and its flows; on the other, they impress a new moral order on the city by introducing specific technical parameters in order to distinguish between the 'good' and 'bad' city" (Vanolo, 2014).

"Cities are attractive actors, and in this phase of technological development, cities are driven by competition over prediction products that relies on algorithms, sensors and platforms" (Zuboff, 2019).

Report ICityRank 2019-2021

Inspiration for the raking comes from the research paper (Giffinger et. al, 2007) "Smart cities: ranking of medium-sized European cities"[2].

The observation that ICT solutions can facilitate urban growth and urban restructuring was also promptly seized on by a number of large multinational companies, which have significantly contributed to the production and circulation of the smart city discourse.

Considering the fact that these reports assume a vision of 'smart city' intended as efficient, technologically advanced, green and socially inclusive city. Urban analysts estimate and measure how 'smart' cities are—i.e. how 'good', 'healthy' and 'technologically advanced' they are in specific fields.

The dissemination of urban benchmarking techniques is part of this framework.

FPA Digital 360 developed a survey, I City Rank, that every year from 2012 ranks the path to the digitalisation of Italian cities based on a statistical analysis of 36 indicators and 130 variables.

107 municipalities of Regional County Seat.

Index: 1. Online services 2. Municipal apps 3. Enabling platforms 4. Social PA 5. Open Data 6. Openness 7. Public Wi-fi 8. IoT and network technologies.

Online services – were increased during the Covid-19 especially the Sportello Unico per le attività produttive e certificate anagrafici. Leading Cities: Bergamo, Cremona, Verona, Piacenza e Milano...

Municipal apps (managed directly or through related companies or entities) – calculated on 6 sectors: cultural/tourism, mobility, waste, security, institutional level and youth - are constantly increasing. Leading Cities: Bologna, Firenze, Modena, Trento, Reggio Emilia…

Enabling platforms – PagoPa payments has been completed in all the 107 cities leading to a growth in transactions. Leading Cities: Bologna, Milano, Pisa, Firenze, Torino…

At the top of the "government capacity" ranking are the Emilia-Romagna Region cities: Bologna takes first place, just ahead of Ravenna by a small margin, while Forlì, Reggio Emilia, Parma and Modena follow close behind with a good result in the indicators of civic participation/social

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[2] Smart economy: innovation, entrepreneurialism, the flexibility of the labour market, integration in the international market and the ability to transform. Smart mobility: referred to local and supra-local accessibility, availability of ICTs, and modern, sustainable and safe transport systems. Smart governance: related to participation in decision-making processes, transparency of governance systems, availability of public services and quality of political strategies. Smart environment: understood in terms of attractiveness of natural conditions, lack of pollution and sustainable management of resources. Smart living: involving the quality of life, imagined and measured in terms of availability of cultural and educational services, tourist attractions, social cohesion, healthy environment, personal safety and housing. Smart people: linked to the level of qualification of human and social capital, flexibility, creativity, tolerance, cosmopolitanism and participation in public life.

cohesion, discrete values in the legality and safety index and, above all, high results in the use of new administrative innovation tools.

3. ADM in action: case studies

3.1   Case 1: "RiskER"

- Alston's typology: risk scoring and need classification, communication.
- Case of datafication, automation and profiling
- Scale/territory affected: regional level, Regione Emilia Romagna
- Stage of automation is it and the time frame: fully automated system
- Core welfare: healthcare

Implementation

"RiskER" is a statistical procedure that combines over 500 demographic and health variables in order to 'predict' the risk of hospitalization. The automated system was developed by the Agenzia Sanitaria e Sociale (Health and Social Agency) of the Emilia-Romagna Region together with the Jefferson University of Philadelphia.

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Different actors were involved in this case, including citizens and public actors. For what concerns citizens the validation process has shown that the algorithm could predict health risk of the age group from 14 years old and over and especially older people where the risk for hospitalisation are higher. During the experiment, the algorithm grouped the population according to four risk categories, allowing doctors to identify high-risk patients, and contact them, The "RiskER" algorithm is part of the EU's "Sunfrail" program which is aimed at helping the elderly. With regard to public actors, the following were involved: Health and Social Regional Agency, Case della Salute and Jefferson University of Philadelphia.

The model, published in 2014 (Louis et al., 2014), was based on regional administrative data, included the entire adult population aged 18 years or older residing in the region, and used all hospital admissions or deaths from potentially preventable problems as outcome variables. However, the model was based only on health data and in the perspective to overcome this limit a similar study was conducted in Bologna (Pandolfi et al., 2016), that included social determinants

(such as the deprivation index and family income), showed that the risk of emergency hospitalisation or death is significantly and independently increased in people with low income and/or living in deprived areas.

For the construction of the model, the administrative data provided by the Emilia-Romagna Region's information system were used, on an individual basis (approximately 4 million assisted persons).

The *goodness of fit and performance* of the algorithm RiskER has been calculated as ad one of the best model from the point of view of data calibration and good accuracy.

From the point of view of the project, this case is interesting because it is a case of ADM since it involves the adoption of an algorithm that processes the statistical data gathered and analysed to decide on a prediction on the risk of hospitalisation of citizens.

The possible places for information are mainly "Case della Salute" in Emilia Romagna Region.

Instead, in terms of the advantages and disadvantages of this case, we have on the one hand, that the main advantage is that many possible theoretical entry points can open up; on the other hand, the disadvantage might be that the ADM system being in the experimental stage can make it difficult to access the field regarding privacy issues.

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3.2   Case 2: "Graduatoria GPS"

- Alston's typology: risk scoring and need classification, communication.
- Case of datafication, automation and profiling
- Scale/territory affected: regional level, Regione Lazio
- Stage of automation is it and the time frame: fully automated system
- Core welfare: education

Implementation

Graduatoria GPS (Graduatorie provinciali per le supplenze) - algorithm for teachers' mobility.

Follows the framework of the "Buona Scuola" education reforms, an automated system that was designed to evaluate how to manage the mobility of teachers for the 2016/17 academic year, the GPS Graduatoria were introduced by Ordinance No. 60 of 10 July 2020 by the Minister of Education, Lucia Azzolina, with the aim of facilitating and speeding up the allocation of vacant professorships. These are lists of teachers with full access to specific competition classes, drawn up on a provincial basis taking into account the points obtained by each aspiring teacher. Specifically, the Provincial Education Offices (USP) use the provincial substitute teaching lists to assign long-term substitutions in preschool, primary and secondary schools of I and II grade.

The algorithm was supposed to aggregate data on each candidate's score ("graduatoria") attributed by law depending on three specific criteria: work experience and roles, 15 preferred destinations, and the actual vacancies. The aim was to provide every teacher with the best possible outcome.

Different actors were involved in this case, including citizens and public actors. For what concerns citizens we have teachers of the Preschools and primary and secondary schools of I and II grade. With regard to public actors, the following were involved: Ministery of Education, Regione Lazio and USRLazio Ufficio scolastico territoriale.

Imaginaries and discourse are projected on generating and increasing the "*culture of measurement in public administrations*" and encouraging the implementation of a system of indicators useful for measuring the performance in the management of certain common cross-catting processes. An experimental phase was launched in 2019 to share a set of indicators: Human Resources Management; Procurement management and property management; IT resource management and digitisation; Communication and transparency management.

The problems inherent in this system concern teachers bypassed by colleagues with lower scores, teachers assigned to non-existent chairs, and teachers considered to be quitters. In a sea of protests and appeals.

However, this case also has some advantages: this is a case that involved thousands of teachers every year whose job place is assigned automatically by the algorithm and has been in place since 2015-2016 introduced with the Buona Scuola reform. These experiments are going on mostly unchallenged and with negative impacts for teachers that mistakenly have been assigned to the wrong professional destinations according to mobility rankings and to a more general level to the public education institutions at large.

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3.3 Case 3: "Abbiamo i numeri giusti" ("We have the rights numbers")

- Alston's typology: risk scoring and need classification, communication.
- Case of datafication, automation and profiling
- Scale/territory affected: regional level, Regione Lazio
- Stage of automation is it and the time frame: fully automated system
- Core welfare: healthcare

Backround and Purpose

Abbiamo i numeri giusti (We have the right numbers): ADM system for mediacal treatment support

The "Abbiamo i numeri giusti" project is designed by the Università Cattolica del Sacro Cuore in Milan, with the contribution of Merck (Big Pharma), the "Abbiamo i numeri giusti" ("We have the right numbers") project is an automated system that helps health institutions pick the most efficient and effective treatments for patients while, at the same time, it optimises public spending on data and evidence-based grounds.

According to Merck, over 200,000 people die every year in Europe because they don't follow their treatment correctly. The system, which aims to maximise patient engagement and medical compliance, will be tested and validated nationwide, starting with trials in five regions (Emilia-Romagna, Veneto, Toscana, Lazio and Puglia) and using their existing databases.

Here the types of actors involved are citizens, in this case patients, as public actors we have Università Cattolica del Sacro Cuore and as private actors we have Merck.

The language used in this case is oriented towards the efficacy of the intervention on patients and in this way, this will be possible for institutions to choose the most effective policies to improve treatment adherence and, consequently, increase positive outcomes for patients with automatic reduction of waste and increase cost-efficiency.

The interesting thing about this project is that the project is considered an „*opportunity to scientifically demonstrate the economic value of active patient involvement in terms of increased therapeutic adherence and thus greater social and economic sustainability of the healthcare system*" and the algorithm will be tested and validated nationwide.

So far, the information has been received through Algorithm Watch report 2019 and local journals.

The benefit of this case directly depends on the possible increase in the level of adherence to therapy. This means "increasing the chances of cure and, automatically, reducing, if not eliminating, the resulting waste. Waste that is not limited to the cost of the therapy then discontinued, but refers to relapses, improper hospitalizations, not to mention costs related to, for example, lost work days." The problem that had to be solved was "to develop a tool to identify, based on objective evidence, the interventions aimed at increasing adherence that would give the best return in terms of both health and economic sustainability."

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3.4 Case 4: "Digital Twin"

- Organisational context: Alma Mater, the Municipality of Bologna, CINECA, the Municipality of Barcelona and Barcelona Supercomputing Centre work together to develop the project to establish digital twin cities
- Alston's typology: identity verification, eligibility assessment, risk scoring and need classification, communication.
- Case of datafication, automation and profiling
- Scale/territory affected: city level, the Municipality of Bologna
- Stage of automation is it and the time frame: three-year-agreement of cooperation between the partners, but it can be extended for another three years.
- who is the beneficiary/recipient of ADM outcome: individual? organisation? the public?: especially public, because of the focus on climate topics, mobility, and energy; will certainly have an impact also on the individual level of citizens.
- Communal welfare infrastructures: smart city

Backround and Purpose

The objective of the Digital Twin is moving towards a model of decision-making and public policy-making based on evidence and impact assessment; data is collected from the real process, typically from IoT sensors, to virtually map its behaviour; the digital twin uses the data collected to simulate and predict the behaviour of the real entity; HPC infrastructure is important. It is a case of modelling urban dynamics using big data. In the case of a city, the digital twin makes it possible to foresee the impact of public policies before they are implemented. The main characteristic of a Digital Twin: Multiphysical (simulates multiple physical systems or phenomena), Multiscale (can reproduce the overall behaviour at a scale ranging from large to small as required), Modellabile (adapting the technology to different use cases), Multidisciplinary (different disciplinary fields), Probabilistic (use of statistical methods and machine learning algorithms for real-world simulations), Dynamic (real-time data and stay up-to-date).

In this case the actors that have been involved are citizens and stakeholders. As public actors we have National Center for HPC, and other sectors of the city Administration, CINECA, University of Bologna and as private actors we have Big Data and Quantum Computing

Automation in this case is framed as a digital representation of real physical systems in which data is input in real-time and analyses information to the systems it copies in order to assess their

functioning and anticipate their behaviour. The main idea is to identify critical issues and problems, minimise production time and costs, optimise performance, simulate scenario analyses and facilitate decision-making processes.

What is interesting here is that increasingly accelerated technological developments are taking place that allow for intensive experimentation and deployment without highlighting critical issues or failures.

Information so far has been sourced through website and the first meeting and case discussion in the Univesity of Bologna.

As possible observation sites we find Bologna Municipality of Bologna and Fondazione Innovazione Urbana. Bologna is the ideal location to realise Italy's first digital twin city, a project of digital replication of the city structure that, through data, machine learning and the internet of things (IoT), allows to optimise, innovate, build scenarios and provides new services, increase citizen participation and experiment cutting-edge responses in the key European fields of the Green Deal and the Economy at the Service of People.

The advantages of this case are that it might involves many areas (core and communal welfare) and many actors. The disadvantage, on the other hand, is that it is an important case but difficult to access since it is at an early stage.

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