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# A three-dimensional framework to analyse the governance of population registers

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**Abstract.** In June 2006, the Swiss Parliament made two important decisions with regards to public registers' governance and individuals' identification. It adopted a new law on the harmonisation of population registers in order to simplify statistical data collection and data exchange from around 4'000 decentralized registers, and it also approved the introduction of a Unique Person Identifier (UPI). The law is rather vague about the implementation of this harmonisation and even though many projects are currently being undertaken in this domain, most of them are quite technical. We believe there is a need for analysis tools and therefore we propose a conceptual framework based on three pillars (Privacy, Identity and Governance) to analyse the requirements in terms of data management for population registers.

**Keywords:** governance, population registers, identity, privacy, Unique Person Identifier (UPI).

## 1 Introduction

The increasing use of Information and Communication Technologies (ICT) has gradually permeated almost every domain of our daily life. The rise of this information or network society [1] generates a fast-growing volume of electronic records, reconfiguring among other things the way governments manage their population registers. Relying increasingly on the aggregation of data about individuals, such registers tend to integrate a Unique Person Identifier (UPI).

In Switzerland, the Parliament made in June 2006 two important decisions with regards to public registers' governance and individuals' identification. It adopted a new law on population registers<sup>1</sup> aimed at simplifying data collection and exchange of personal data between registers, and it also approved the introduction of a new old-age and survivors' insurance<sup>2</sup> number [2]. Both decisions are closely related, as the

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<sup>1</sup> The Federal Act on the Harmonisation of the Register of Residents and of other Official Registers of Persons. [www.admin.ch/ch/e/rs/4/431.02.en.pdf](http://www.admin.ch/ch/e/rs/4/431.02.en.pdf)

<sup>2</sup> The Old Age and Survivors' Insurance (OASI) is the main Swiss social security insurance which provides pensions for retired persons, widows/ widowers and orphans. This insurance

law on the harmonisation of registers intends to use the new social insurance number to uniquely identify individuals in the official registers of persons.

The structure of this paper is as follows. First we present the recent changes in the Swiss law affecting public registers and personal identification. Then we outline the notions of governance, identity management and privacy. On the basis of these concepts, we propose a three-dimensional framework to study population registers' governance. We conclude by giving some insight into future work we intend to undertake.

## 2 The Swiss public registers

According to the United Nation Statistics Division [4], the main administrative function of public registers is to provide reliable information for the various purposes of government. This encompasses program planning, budgeting and taxation; the issuing of unique personal identification numbers; the establishment of the eligibility of individuals for voting, education, health, military service, social insurance scheme; and for police and judicial references.

### 2.1 Recent evolution of Swiss public registers<sup>3</sup>

So far public registers are very fragmented in Switzerland. Until 2004 vital records (births, deaths, weddings, and adoptions) were held on paper registers by 1750 Cantonal offices throughout the country. Since then the Federal Department of Justice and Police provides Cantons with a centralized database called Infostar. In addition to these cantonal registers there are more than 2500 disconnected communal registers of residents. In the Canton of Bern alone, 392 communes use 26 different software solutions to manage residents' data [5].

Beside these "stricto sensu" population registers, there are several other registers that store data on citizens: fiscal register, foreigners' register, building and housing register, and so on. Other databases that are not directly considered as registers are also connected to the official registers and store records on education, social welfare services, military, etc.

As long as the thousands of Swiss public registers were paper-based or not interconnected, there was little need to study the governance of these registers' data. The situation has evolved with the Federal Act on the Harmonisation of the Registers (FAHR). Approved in June 2006 and enacted in January 2008, its purpose is twofold: first, to simplify the statistical use of data contained in the registers of persons, and secondly to foster data exchange between these registers, namely:

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covers all individuals who live or are gainfully employed in Switzerland and is compulsory for foreign nationals too.

<sup>3</sup> By public register, we mean any register maintained by law, regulation, or practice, by or on behalf of a unit of Federal, cantonal, or local government, that contains information that can be linked to a specific individual. No inference should be drawn by the use of the term that any type of information identified as a public register is or is not publicly available [3].

- the computerised civil status register (Infostar) maintained by the cantons and operated by the Federal Office of Justice;
- the Central Migration Information System (ZEMIS) of the Federal Office for Migration;
- the information system for diplomats and international civil servants (Ordipro) of the Federal Department of Foreign Affairs;
- the matriculation register maintained by the Swiss diplomatic and consular representations abroad for the networked administration of data and for the Swiss Abroad (VERA) maintained by the Federal Department of Foreign Affairs;
- the Central Register of Insured Persons, the Central Pensions Register and the Register of Benefits-in-Kind of the Central Compensation Office.
- the cantonal and communal registers of residents as well as electoral registers

Research in the domain of public registers' data governance is scarce, as many countries do not have decentralized registers as they exist in Switzerland (they are maintained at a central level, e.g. Ministries), while some countries do not have population registers at all. Furthermore, as long as public registers were paper-based or not interoperable, the control of these registers was made de facto as reproduction or search of an entire database was difficult or impossible [6]. With the spread of computers into government records keeping, new capabilities allow access at multiple locations, research and sorting by different criteria, and inexpensive reproduction of complete databases. This challenges older policies established while data were kept on paper registers.

## 2.2 The necessity of a Unique Person Identifier

The next Federal Census planned for 2010 should use data provided by these various population registers (previous censuses were based on questionnaires and interviews). In order to collect and aggregate data automatically, a UPI is required for each Swiss resident. Thus, the FAHR approved by the Parliament in 2006 allows the use of the new old-age and survivors' insurance number as a UPI. Although it guarantees the complete anonymity of insured persons<sup>4</sup>, the use of this number as a UPI in official registers raises some questions in terms of privacy and identity management.

Indeed, despite consultation procedures launched by the Federal Council during the years 2003-2004, three successive UPI projects have been rejected by interested parties, mainly for data protection issues [7]. Following a first proposal to introduce a UPI for all public registers, a second project envisaged to establish six sector ID numbers for population, social security, tax, defence, justice and statistics. Supposed to insulate data and to protect citizen's privacy, neither this proposal nor a third one

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<sup>4</sup> The previous number had data informing about the date of birth, the sex, the first letters of the surname, and the Swiss or foreign nationality.

providing a UPI limited to the domains of residents, civil status, foreigners and refugees found favour with circles close to data protection.

Given the difficulties of finding a consensus on a new law aimed at providing a univocal number to identify individuals in public registers, the Federal Council chose as a UPI the new old-age and survivors' insurance number which was one among other amendments to the OASI law. Approved by the Parliament in 2006, together with the FAHR, this decision bothered several actors with whom we have discussed (politicians, data protection commissioners and other civil servants) for the lack of discussion surrounding the imposition of this UPI.

Far from being a Swiss particularity, these last ten years have seen a growing tendency toward the usage of UPI within European countries [8]. Nevertheless, some countries are explicitly against the implementation of such numbers for data protection concerns. In Germany for instance, "it is already certain that there will be no universal personal identifier, [...] because this would be hardly justifiable under data protection law"<sup>5</sup>. This is the only country of the fifteen original EU members to be explicitly against an UPI for the future.

### 3 Conceptual insights

To study the Swiss public registers, we selected three concepts that need to be defined more precisely: governance, identity management and privacy.

#### 3.1 From governance to e-governance?

One of the main areas of research we want to look into is the elaboration of rules and the decision processes that govern the management of the registers' personal data, especially with the new possibilities provided by the information society. In order to achieve this goal, we will first define more precisely what the concepts of governance and e-governance encompass.

Governance is such an elusive concept that some consider "there are almost as many ideas of governance as there are researchers in the field" [9]. According to the United Nations Development Programme which published a policy paper on governance for sustainable human development [10], governance is the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It is participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and follows the rule of law.

Incorporating the elements of the UNDP definition, Kauzya further defines governance as a multifaceted compound situation of institutions, systems, structures, processes, procedures, practices, relationships, and leadership behaviour in the exercise of social, political, economic, and managerial/administrative authority in the running of public or private affairs [11].

Except by referring to *kybernan*, the Greek root of governance meaning "to steer" (a ship or a chariot), any consensus on a definition of governance is hard to achieve.

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<sup>5</sup> [www.deutschland-online.de/DOL\\_en\\_Internet/broker.jsp?uMen=3ec0071d-6f2a-2114-fbf1-b1ac0c2f214a](http://www.deutschland-online.de/DOL_en_Internet/broker.jsp?uMen=3ec0071d-6f2a-2114-fbf1-b1ac0c2f214a)

However, there are two domains that are well defined and widely accepted: political governance (whether global, local or territorial) and corporate governance. Both share a common approach based on decision processes and stakeholders' participation (shareholders, executives, political leaders, citizens, interest groups or any other organisation). As we want to study the governance of public registers, it is clearly the political governance that we are interested in.

Widely used and discussed both in the public and private sectors, the governance approach emerges together with the computerisation of the society. Some writers speak about information and governance revolutions, and estimate that e-governance lies at the heart of these two global shifts [12]. In a recent article, Dawes describes e-governance as a dynamic and open socio-technical system where social elements and technical aspects are continually evolving on their own while continuously interacting with each other in ways that cannot be controlled [13]. This system is made up of six dimensions: societal trends, human elements, interaction and complexity, information management, purpose and role of government, and changing technologies. Each dimension includes a number of factors, among them privacy, identity and trust for the human elements. These factors have also been identified as the first research fields in a project funded by the European Commission which aims at sketching e-government in 2020 [14].

Data governance has a specific meaning in the field of Information Systems. Encompassing the people, processes and technology, it refers to the overall management of the consistency, accessibility, usability, integrity, and security of the data employed in an organization.

### **3.2 Identity Management and privacy**

Lying at the heart of many forms of government service delivery, personal identification<sup>6</sup> was based until recently on manual form filling and paper-based authentication processes, with then a storage (and most of the time oblivion) of the form. With the digitalization of registers and their use to provide specific information for an administrative procedure, these identification mechanisms are not sufficient anymore. There is also a qualitative difference between the granting of online access to information and its provision in paper form [16].

If the extensive use of ICT to gather, process, share and store personal data brings about real enhancements with regard to public services, it generates tensions and debates as well. By implementing a UPI within public registers, the FAHR makes the multiple identities citizens have when dealing with different parts of the public sector (as individual, elector, taxpayer, student, unemployed person, soldier, patient, prisoner, and so on) interoperable.

However this paper is not about a technical approach of eIdentity management (user name, password, personal identification numbers, smart cards, PKI, fingerprint readers, mobile phone, and so on). We are interested in the legal-normative approach of identity management, answering to questions such as how does the law on public

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<sup>6</sup> To get a better understanding of concepts like identity, identification and authentication, see [15].

registers' harmonisation fit together with data protection legislation? Furthermore the Swiss Confederation and many Cantons have a law on transparency stating that all public documents and information must be publicly available, with exceptions for national security, trade secrets and citizen's privacy [17].

*Privacy* issues are closely linked with the *interoperability*<sup>7</sup> between registers, both domains being presented as key tensions at the launch of the new journal *Identity in the Information Society* [19]. The link between the privacy of personal information and the use of ICT by public authorities was already tackled by the U.S. Office of Technology Assessment in the eighties [20]. Since then, while the extent of privacy infringement depends on the definition we have of this elusive concept, concerns regarding data profiling and data mining<sup>8</sup> are often expressed. Another well-known phenomenon in database management is the re-purposing [21], also named data creep [22] or function creep [23], [24], [25], and defined as the gradual use of personal data for a purpose other than that originally declared. Without explicit legal grounds, these unanticipated or secondary uses are illegal.

So far we have portrayed general dimensions of governance, identity management and privacy. We still need to specify sets of requirements that will define our three-dimensional framework. By following this framework, this should allow us to analyse governance processes of population registers' data, considering privacy and identity management dimensions and allowing us to formalise relationships between actors, processes and data.

## 4 A three-dimensional framework

Our framework explores the potential of three approaches to the analysis of Swiss population registers. These three approaches are:

- a) on governance, the COBIT model
- b) on identity management, the laws of identity developed by Cameron
- c) on privacy, a set of criteria from the Swiss and European data protection laws

### 4.1 The COBIT model

To specify the set of requirements in terms of data governance, we will use the information criteria of CoBIT [26]. This framework for IT governance consists of a set of good practices ensuring that IT is aligned with the business and enables business processes. It also provides resources for risk and performance management. The data requirements (or information criteria) defined by CoBIT are:

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<sup>7</sup> Interoperability refers to the ability of information and communication technology systems and of the business processes they support to exchange data and to enable sharing of information and knowledge [18]

<sup>8</sup> Data profiling is the process of examining the data available in an existing data source and collecting statistics and information about that data. Data mining is the process of extracting hidden patterns from data. Source: [www.wikipedia.org](http://www.wikipedia.org)

- *Effectiveness*: relevant, correct, consistent, usable and timely information.
- *Efficiency*: provision of information through the optimal use of resources.
- *Confidentiality*: protection of sensitive information from unauthorised disclosure.
- *Integrity*: accuracy, validity and completeness of information.
- *Availability*: information is available when required.
- *Compliance*: information use is complying with the laws, regulations and internal policies.
- *Reliability*: information can be trusted.

## 4.2 The seven laws of identity

Apart from this governance dimension, an identity layer must be added to our framework. Cameron defines digital identity as a set of claims made by one digital subject about itself or another digital subject, with a digital subject being a person or a thing and a claim being an assertion of the truth of something, e.g. “I am Paul and I am over 18”, “I am Mary and I am married to John” [27]. Cameron furthermore defines seven laws of identity that are now widely used:

- *User control and consent*: digital ID systems must only reveal information identifying a user with the user’s consent.
- *Minimal disclosure for a constrained use*: the solution which discloses the least amount of identifying information and best limits its use is the most stable long term solution.
- *Justifiable parties*: digital ID systems must be designed so that the disclosure of identifying information is limited to parties having a necessary and justifiable place in a given identity relationship.
- *Directed identity*: a universal ID system must support both “omnidirectional” identifiers for use by public entities and “unidirectional” identifiers for private entities, thus facilitating discovery while preventing unnecessary release of correlation handles.
- *Pluralism of operators*: a universal ID system must channel and enable the interworking of multiple identity technologies run by multiple identity providers.
- *Human integration*: the universal ID metasystem must define the human user as a component integrated through protected and unambiguous human-machine communications.
- *Consistent experience across contexts*: a unifying ID metasystem must guarantee its users a simple, consistent experience while enabling separation of contexts through multiple operators and technologies.

According to his own words, Cameron defined these laws with the goal of “giving Internet users a deep sense of safety, privacy and certainty about who they are relating

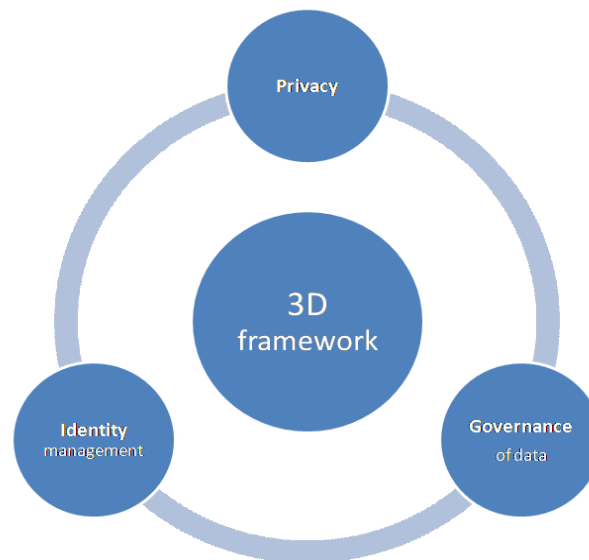


to in cyberspace”. The context of population registers managed by the public sector is different, but these laws are still very relevant, even if they need to be adapted in some cases.

### 4.3 Criteria from the Swiss and European data protection legislation

The third dimension of our framework relates to privacy. Referring both to the Swiss Federal Act on Data Protection [28] and to the European Directive on the protection of individuals with regard to the processing of personal data [29], we can put forward the following key principles:

- *Lawfulness*: personal data must be processed lawfully.
- *Purpose*: personal data must be collected for specific and legitimate purposes.
- *Proportionality*: personal data must be proportionate with the purposes for which they are collected and/or further processed.
- *Accuracy*: personal data must be accurate and up-to-date. Inaccurate or incomplete data should be erased or rectified.
- *Anonymity*: personal data must be preserved in a form which permits identification of data subjects for no longer than required for the purposes for which the data are stored or further processed.
- *Obviousness*: the collection of personal data and especially the purpose of its processing must be evident to the data subject



**Fig. 1.** The three-dimensional framework

## 5 Conclusion

The pace of technological change that characterizes today's networked society brings about many risks and opportunities. Population registers are no exception, but our framework enables us to consider the action of governments with respect to its data governance. This should help to set up an approach that identifies citizens in ways that respect their personal privacy and builds confidence in government services, while allowing the sharing of relevant data in order to deliver more personalized and interconnected services.

In order to launch a broad study on population registers, we are currently in discussion with various stakeholders: Cantons, communes, Swiss Federal Statistics Office, and other research centres. We will use our framework to analyse needs and requirements of these various stakeholders in terms of data exchange and of registers' harmonisation. We believe this project will offer a very interesting field of experimentation and validation for the approach described in this paper.

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