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The Norwegian national identification numbering system

The history of a design process

Hanne Neverdal Frestad

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Supervisor: Ian Watson, ID

Norwegian University of Science and Technology
Department of Design

Abstract

The Norwegian national identification numbering system, introduced in the 1960s, is an important tool used in all parts of public administration in Norway today. By serving as a means for identifying people, the numbering system makes administrative work and communication between public agencies and individuals more effective. The country's residents are listed in a central population register and assigned unique identification numbers. The numbers function as labels for the bundles of information tied to individuals registered in an information system. The Norwegian word for the number is fødselsnummeret (literally, 'the birth number'). It is such an integral part of everyday life in Norway that most people take it for granted and think of its design as a given, naturally discerned from the information it represents.

This master's thesis examines the history of the national identification numbering system in order to understand the design process behind it. It turns out that the design and implementation of the numbering system was influenced by a wide range of factors, including technology, law, and user needs. In a proposed redesign of the system presented to the Norwegian parliament in March 2017 the balance of the various influencing factors has shifted and an emphasis on user needs and a user-centered approach to design has emerged.

Preface

Interaction design is a wide field with many opportunities, and being an indecisive soul I found it hard to choose in what direction to go with my master's thesis. After numerous hours of searching for an interesting topic, a conversation with a former teacher of mine, *Ole Lund*, pointed me towards the Norwegian national identification numbering system, a system I knew very little about at the time. I jumped on the opportunity and haven't looked back since.

Since then I have learnt a lot about human identification as I worked on the thesis during the spring semester of 2017. I would like to thank my supervisor, *Ian Watson*, for invaluable guidance, and for being patient and understanding through half-done and untidy drafts.

I would also like to extend a big 'thank you!' to *Kåre Vassenden* and *Halvard Skiri*, respectively present and former employees at Statistics Norway, for invaluable help with getting the history right and digging up relevant information about the national identification numbering system. Undeniably this master's thesis would have been at a completely different level had they not been so generous with their time and advice on improving my work.

Support from friends and family has been a source to motivation throughout the process. Thank you for good conversations and laughter, and for pulling me back those times when stress got the best of me.

Finally, a big thank you to my husband for showing patience, understanding, and support through the duration of the project.

Gjøvik, 1 June 2017
Hanne Neverdal Frestad

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1 Introduction

Nationally standardized identification numbering systems are found in most countries across the globe. There is, however, not one type of system that can be said to be 'more correct' than others or 'the best', and having a national identification system is not a given everywhere. The opinions on identification numbering are divided, something that is essentially reflected in all the very different systems for civil registration and individual identification in existence. Some countries have laws against establishing national identification numbering systems and national registers containing data on all individuals of the population, while others—Nordic countries in particular—have embraced the use of national identification systems as a tool for more effective administrative work in both the public and the private sectors. Norway currently uses a number called the fødselsnummer (literally, 'birth number') to identify its citizens and residents.

1.1 Civil registration and information design

Modern national identification systems are the results of centuries of evolution in human identity practices. At one stage people were mostly anonymous outside of their home communities. Later, documents for identification were introduced. In Nordic countries today, people have official juridical identities that are tied to national identification numbers.

The juridical identities of people in Nordic countries today are inscribed in national civil registers. These registers are information systems where there is a record for each juridical identity. To represent people in an information system requires having some kind of handle for them, something that makes it possible to query the database. This handle cannot be a physical document, like an entry in a baptismal register or a birth certificate. Nor can the handle be a person's name, as it is not unique enough, and in many cases, a name is not constant through a person's life. It must be something constant and unique that can be efficiently handled by a computer system, distinguishing each and every entity (person) in the system from each other. Although these handles must be unique and must contrast with each other, equal and efficient data processing of all entities is hard to achieve unless there is a certain coherency across the data set. In order to ensure that a set of handles will work over time they must be designed in a thoughtful way. Ian Watson (2005) talks about the design process for such sets of labels, which he refers to as contrast sets. Countries that implement a national identification system decide that such a system is worth designing and making available as a

public good for corporations and individuals to benefit from. In doing so they have to figure out how to design the system and how it should be used.

Before the idea of using identification numbers arose and was put into action, people proved their legal identity by showing identification documents. We still use identification documents to prove identity today. For instance, people are expected to bring their passport in order to prove their identity when traveling across state borders or when opening a bank account. What is different today, though, now that we use identification numbers, is the way that the links that tie the bundle of various identification documents to each other and to a person are proven. In earlier times, people would have to prove the links themselves whenever proof of identity was needed. Today identification numbers are used to represent these links, functioning as an abstract code that ties the bundle together. Through this the number also functions as an abstract name or label for the entire bundle of documents and information that makes up an entity that is, essentially, a person. The person, however, is not always physically present during the administrative processes that involve the number. Identification numbers, like code names for different software versions, confer a handle on something rather slippery and intangible that has to be dealt with on a regular basis.

People are more than numbers and do exist prior to and separately from their labels. However, assigning identification numbers to each member of a system ensures visibility and entitlement to rights within a greater system. Utilising a coherent system of identification numbers promotes efficiency: users waste less time looking for information, leaving more time for actual productive work. The Nordic central population registers and their associated national identification numbering systems promote efficiency in public and private administrative work. The numbering systems are not only used in the central population register databases, but also in local registers within various state agencies, private enterprises and organisations. This means that individuals need just the one identification number for dealings with all public authorities, and effective communication is ensured between different registers by the universal labeling of individuals.

The history of the Norwegian national identification numbering system is also the history of a design process. The introduction of the national identification numbering system marked a shift where the physical tokens of identification became less important than that which linked the tokens together, and so the focus of the design process for identification shifted from the physical documents to the computer system that tied these together. At the birth of the Norwegian national identification numbering system its designers may not have taken a consciously user-centered approach, but keeping the users in mind in some way or

another did ensure that the system would benefit state, individuals, and corporations as well as possible.

When the Norwegian identification system was designed in the 1960s it was developed with contemporary needs and problems in mind. Now, more than 50 years later, new and completely different matters need to be taken into account as a new numbering system is being developed. A modernisation programme, *Moderniseringsprogrammet*, aims to reorganise the Norwegian national register, *Folkeregisteret*, as well as its associated national identification numbering system, in order to ensure that the system is able to cater the needs of a modern society and a population with high expectations and demands tied to living in a digitized world. What user-centered design aims to ensure is the development of a solution that is relevant to and rooted in the actual needs of actual users. In order to find a solution that facilitates smooth and effective interaction between users and the register, the modernisation programme has involved stakeholders in different ways throughout the process. User input from both workshops and consultation statements have helped point the project in the direction of an appropriate design. The nature of the data in the register—namely personal information that makes up the juridical identities of individuals—has also been of importance to the development of the system. Care has been taken to protect the privacy of those registered as well as their rights and needs as stakeholders of the system. The design process has involved changes to the laws on population registration, the regulations derived from these laws, and the structures of the register itself and the associated identification number.

2 Methods and background

The nature of this thesis—a historical study—calls for historical methods. That entails finding out information about the past from both primary and secondary written sources.

The thesis has a small comparative aspect as well, as it looks at the corresponding institutions in other Nordic countries. Both the identification number itself, the register it is tied to, and the way both are used will be subject to this comparison. In comparing the practices of the different countries I will look for patterns and recurring themes.

As this study is not a purely empirical study, issues of validity, generalization, and reliability do not apply to the study to the same degree as in a study including human subjects, survey data, or sample data.

2.1 Concepts explained

It is important to distinguish between two processes involving human identity, both common in everyday life within society, but distinct and important to keep separate. **Identification** is the process of discerning or pinpointing an identity among other identities, whereas **authentication** is the process of validating or verifying beyond doubt that an individual is the individual with a certain identity.

Another central term within civil registration and human identity in Norway is the population register, **Folkeregisteret**. I divide the term into three main meanings: the register itself, the registry authority, and the closest registry office where citizens can go to register information. To differentiate between these meanings, I have chosen to use the Norwegian name, Folkeregisteret, as a general term for both the institution and the legal register. The term **central population register**, or **CPR**, is used to refer to the database system and its technical aspects. I also make a distinction between the terms **register** and **registry**. The first refers to the instrument for registration, the database system, whereas the latter refers to the physical location of registration, such as a local registry office.

A **national identification numbering system** is a numbering system used for identifying residents within a state. Every individual is registered with a unique number which ties the individual to information stored in population register databases. **Fødselsnummeret** is the name of the Norwegian national identification number, assigned to residents in Norway.

Folkeregisteret is going through a process of renewal and modernisation in order to meet the needs of modern society and a growing population. Included in this project is a review of the national identification numbering system, which plays a vital role in the registration

system. This particular process is part of a programme called *Moderniseringsprogrammet*, **the Modernisation Programme**.

2.2 Problem description

The history and current status of the fødselsnummer is described in great length in several sources written in Norwegian, but not all the material is available in English. One goal of this thesis is to gather together the facts and history and present them in English for an international audience. Making information available in a universal language like English is a way of reaching out and bringing information not only to scholars but also to a wider range of those people who are touched by the system. I hope that this thesis will be of help to people who use the system and want to understand it better. Making users of the Norwegian national register as well as all those who hold a Norwegian identification number better aware of its properties and intended use may be useful, especially in light of the mismatch between the intended use of the number and its actual use discussed in section 6.

The thesis aims to provide a broad context for understanding the Norwegian identification numbering system. Thus it examines the history of population registration and how the current Norwegian system came into being. The thesis also discusses the current status of the system and its implications, as well as where it is headed, reviewing the motives of the modernisation programme as well as the proposals derived from the project. Finally, the Norwegian identification numbering system is compared and contrasted to other Nordic identification numbering systems. The Nordic countries are known for their identification numbering systems, and the long history of these robustly implemented systems places the Norwegian identification system in an important context.

As this research project lasted for a limited period—six months—with an absolute deadline of 1 June 2017, there were things that time prevented me from including in my work and the thesis is not perfect. Nonetheless, it is a contribution to the field of interaction design and personal identification and a beginning that can be built upon through further research. I would have liked to dig even deeper into the history of personal identity in Norway, but at some point I had to stop digging, and start writing. Another example is that I have not included all the Nordic countries when comparing the Norwegian fødselsnummer with

neighbouring numbering systems. The numbering systems of Finland, Greenland, and the Faroe Islands are left out.

2.3 Research questions

The overall goal of understanding the Norwegian identification numbering system has been broken down into a set of sub-questions. These are answered in the different sections of the thesis.

Section 3 aims to provide essential background on the history of civil registration and personal identification from existing scholarly literature. The subsections of section 3 review the development of individual identification around the world, central debates on identification, the different uses of national identification numbering systems, identification in modern-day societies, and practices in the Nordic countries.

Section 4 tells the history of civil registration and individual identification in Norway before the introduction of the national register and the national identification numbering system. The questions this section aims to answer are: What were the events that led to the introduction of the fødselsnummer? And what main concerns and needs were considered for in development of the number? The subsections review the involvement of the national church, the establishment of birth registers, and the different stages of the introduction of population registers.

The history of the national register and the identification numbering system that it uses, including information on how these systems have been used up to the present time, is found in section 5. The subsections deal with the fødselsnummer, the D-number, and the debates about the system, and try to answer the questions: What did people think about the number when it was introduced as opposed to today, and how was the number used in the 1960s as opposed to today? I try to uncover and discuss both positive and negative aspects of the national identification system, and to create a nuanced picture of the system and its use.

In section 6 the current status and implications of the national identification numbering system are explored and discussed. The section looks at how the system is viewed and used by organisations and individuals in today's increasingly digitized society.

Section 7 focuses on the modernisation programme. What does it entail, and what are its main concerns? This section aims at understanding what is of concern when a Nordic national identification system is remodeled today.

Section 8 ties together information from all the previous sections, discussing how the fødselsnummer and the Norwegian identification system compare to the numbers and

systems in other Nordic countries. There are similarities and differences between the systems and the thesis will aim to explain what might have brought them about.

2.4 Sources

The thesis is based on numerous sources, and some of these are cited more than others. S*tatistisk sentralbyrå (SSB)*—Statistics Norway—is an institution that has played a central part in the history of the registration of the Norwegian population and the development of the national register, and so publications from the bureau are frequent sources in the thesis.

Newspapers have been an important source for records of debates about the ID system and of how the public has experienced the identification numbering system both in earlier times and today. *Aftenposten*, especially, is heavily used as a source as this newspaper allows easy access to all published issues from a digital database. The data base contains a good search engine that allows quick retrieval of relevant articles based on keywords as well as year and date. Material from some smaller local newspapers has also been accessed from the more limited newspaper database at the National Library (nasjonalbiblioteket.no).

National identification practices are regulated by law in the Nordic countries. Therefore, a change of identification practices calls for revisions of the laws, so that they may protect the privacy of the registered at the same time as they allow for utilizing the technology available in a responsible way. The connection between law and practice makes changes in identification practices traceable in the law, which itself is a source to history and the way people have viewed identification.

3 Overview of related literature

A very active global community, made up of an international network of academics particularly interested in the topic of individual identity, has produced high-quality scholarship on how individual identification is and has been documented in different countries around the world. These scholars have repeatedly asked how rights, privacy, and safety are protected or threatened by such documentation. The opinions on this question are divided, and the debates within the community often reveal quite opposing poles, with representatives positioned at opposite ends of the scale. What ties them together, however, is the acknowledgement that there is a need to invigorate the public debate on individual identification by discussing its history and the ideas underpinning identification and registration. Identinet, a network of academics from all across the world, works towards such goals by telling 'the story of individual identitification within a long-term, international and comparative framework' (IdentiNet n.d.).

In the following sections (3.1–3.5) I will discuss a few of the main themes in this literature. Many if these themes will be returned to in more detail in the later sections of the thesis.

3.1 The history of civil registration

There are institutions of civil registration in most countries around the world, and a number of these have been subject to studies by scholars with an interest in civil registration and individual identity. In pace with the changes in society and development of new technology, new techniques for identification have developed at the same time as other techniques have lost their relevance. The literature that view identification in a historical context such as this is large. Two examples of from this literature are *Identifying the English* (Higgs 2011) and *Documenting Individual Identity* (Caplan and Torpey 2001). Edward Higgs is one of the most active and well-known scholars within the field of individual identification. In his book, *Identifying the English*, he walks through the history of personal identification in England from 1500 to the present, explaining different identification techniques against the backdrop of tradition, social status, technology, politics and population turnover. *Documenting Individual Identity* is a result of a collaborative effort between historians, sociologists, historians of science, political scientists, economists, and specialists in international relations, within the previously mentioned IdentiNet network (IdentiNet n.d.). The essays in the book range over a long period of time and across identification systems and practices from many geographic

areas, including Europe, the former Soviet Union, Argentina, and Africa.

Initially the introduction of registration and identification of individuals was in many cases driven by a state's wish to control the movements of the population as well as mapping out the parts of the population liable to pay taxes or fit for military service in case of war (Caplan and Torpey 2001:69,71,206,257,260). Registration and identification has also been used for distinguishing between respectable citizens and undesirable criminals (Higgs 2011:122). The underlying motivation for identification systems can be said to have changed through the years, and with it the beneficiaries have changed. What used to be something that served only state interests today benefits the population as well, and having a juridical identity has put a face on individuals and given them important rights (Setel et al. 2007; Szreter 2007).

3.2 Debates on individual identification

The opinions on the innocence or malevolence of national identification systems are divided, and this is made quite clear through the diverse systems in existence throughout the world. The Icelandic national identification number, the *kennitala*, is presented by Ian Watson (2010) as an 'unusually open' one in the article *A short history on national identification numbering in Iceland*. The way the kennitala is used almost as an alternate name signifies a wide acceptance among the residents of Iceland towards the number and the whole identification system. Seen as practical and useful, the unusual system has managed to stay 'open' despite debates involving privacy concerns and issues of surveillance.

Siding with the sceptics about the benefits of identification numbering systems is David Lyon (2009), who through the book *Identifying Citizens* argues against identification systems. He argues for the perspective that systems for identifying citizens more or less equal surveillance systems, by pointing to the involvement of major high-technology corporations in the development of techniques and systems, and how, looking back in history, registers and identification systems have been used by the state in order to control its citizens. This perception is widespread in England where, according to Lyon (2009), Higgs (2011), and Caplan and Torpey (2001), the use of identification cards is regarded as something opposite to liberty and freedom. Higgs (2011:156) sums this up very well: liberty is regarded as 'freedom *from* the state, rather than *through* a state'.

Still, the use of *one* system consisting of a central register with *one* identification number for every individual in all dealings with the state, as is the case in the Nordic countries, instead of numerous different systems—one for each institution or agency—is thought by some to benefit both individual and state (Ludvigsson et al. 2009; Krogness 2011). By making civil

registration more effective, informing the planning of public services, and providing a reliable database for statistical work, national identification numbers have become something that many people appreciate but might at the same time take for granted in their everyday lives. On the other hand, countries like Germany and Portugal have laws against the use of a single national identification number (Watson 2010:77), seeing the potential harm that such a system in the wrong hands might inflict on the population as greater than the potential benefits that the same system in the right hands might provide.

Another debate referred to by Watson (2010) is that about whether a national identification number should or should not contain personal information—in the case of the Icelandic kennitala, the birthdate. The model used in the Nordic countries, where the number includes the birthdate, is widely accepted there. Although the possibility of dropping the birthdate has been brought up in both Iceland (Watson 2010:76) and Norway (Finansdepartementet 2017:10), the birthdate is still a part of both national identification numbers. In other countries including such personal information in the identification number itself would be unheard of because the birthdate is regarded as information too personal to include in an identification number. Similarly, gender information embedded in the identification number has been subject to debate.

3.3 Use

How ID numbering systems are used varies widely between states. Watson (2010) describes the use of the Icelandic kennitala as very wide. The Icelandic kennitala is used almost as an alternate name, and is not regarded as confidential information that should be kept secret, as identification numbers are in most other countries. There are likenesses between the Norwegian system and the Icelandic one, but this openness is not a trait that they share. Although the identification numbers are meant to do the same job in both countries, Norwegians today guard their identification numbers much more cautiously, and using them as openly as Icelanders do would be unthinkable to most Norwegians. This may, however, change in the future. Through the modernisation programme, recommendations have been made for a move towards a more open use of the national identification number (more about this in section 7.1.3).

The way the identification number is used across different institutions and organisations in Iceland is quite typical for the Nordic countries. As an example, the Swedish national identification number is used, amongst other things, in health care and medical research. Through this the overall health of the population is improved, as its use within health care and medical

research can inform the planning of new services and improvements to existing health services, which helps meet the health-care needs of the population (Ludvigsson et al. 2009).

3.4 ID numbering systems in modern-day society

As mentioned in section 3.1, identification techniques and practices have changed in pace with changes in society. This can be seen all the way through the history of personal identification, such as in the changing techniques for identifying criminal offenders, where the less-than-standardized classification of physiognomies was replaced by fingerprinting (Caplan and Torpey 2001; Higgs 2011:132,133). New techniques replace old ones as they become less relevant or insufficient.

In an article on the Norwegian fødselsnummer Furseth, Ljones and Statistisk sentralbyrå (2015) explain the current shortcomings of the Norwegian national identification numbering system: the number of unused combinations is slowly but surely closing in on zero, and so the system needs to be renewed. Much the same was happening to the Icelandic identification numbering system in the years preceding the adoption of the kennitala; the creation of the kennitala resulted of the need to fix a system running out of possible combinations (Watson 2010:67).

3.5 Identification in the Nordic countries

Danish scholar Karl Jakob Krogness has written about the history of the Danish civil registration system (he has also written and published several articles on the Japanese household registration system and citizenship). The Danish system started out in church books and later came to rely on the creation of a national register, though the church still remained a central institution in Danish civil registration all the way into the twenty-first century (Krogness 2011). Norwegian civil registration started out the same way as in Denmark, with church books, but in Norway the church's involvement decreased and finally ceased at an earlier stage in the development of the civil registration system in order to ensure a wider registration of the population (see sections 4.1–4.2).

The similarities between the identification numbering systems in the Nordic countries are described in the studies by Watson (2010), Krogness (2011), and Ludvigsson et. al. (2009), as well as in the publication on civil registration in Norway by Soltvedt and Statistisk sentralbyrå (2004). All these studies describe identification numbers incorporating birthdates as enabling individuals to remember their own number more easily, and the numbers as a

tool which helps the state keep track of and offer services to all parts of the population. The study by Ludvigsson et al. (2009) on the use of the Swedish identification number within medical research emphasizes the benefits of using the national identification number in registers across organisations and institutions, both in public and private sectors. Although the different Nordic identification numbering systems started out pretty much the same and were inspired by each other, they have moved in different directions over time. Although there are similarities between the construction of the different Nordic numbers, the way the entire system works varies slightly between each country.

4 History of Norwegian civil registration before the ID number

The registration of data on the Norwegian population stretches as far back as to the seventeenth century. Until the establishment of the national register, the most important records of the size and composition of the entire population were the censuses, initiated in the eighteenth century (Soltvedt and Statistisk sentralbyrå 2004:7). Besides the censuses, Norwegian priests had been recording vital data (marriages, births/baptisms and deaths) in church books since the seventeenth century, but these were not at first used for statistical purposes. It also took some time before they were standardised and written in a uniform format (Soltvedt and Statistisk sentralbyrå 2004:146).

4.1 Church books

The oldest general registers of persons in Norway are the books kept by the Norwegian state church (Soltvedt and Statistisk sentralbyrå 2004:162). The earliest surviving specimen dates to 1623, but keeping such records of the population was not made mandatory until about 60 years later. In 1685 a decree required all Norwegian pastors to record weddings, baptisms and burials in church books (Soltvedt and Statistisk sentralbyrå 2004:22). The first books were kept solely for keeping records of clerical rituals (baptisms, weddings and burials), but in 1735 the state began using church book records for statistical work. That year an attempt was made at calculating the size of the population based on the church books. This involved an instruction to all bishops to collect data on births and deaths from all pastors in Denmark-Norway and deliver these data to the Board of Trade in Copenhagen (Soltvedt and Statistisk sentralbyrå 2004:22). When *tabelkontoret*—the tabular office and predecessor of Statistisk sentralbyrå (SSB)—was established in 1835 under the Ministry of Finance, this institution was put in charge of official statistics such as those based on church book records (Backer 1947:214). The way the church books were kept was at first not uniform, but rather depended on the individual pastor (Backer 1947:212). Throughout the nineteenth century the tabular office sought to improve the keeping of vital statistics and gave the clergy gradually more specific instructions as to what data the books were to contain as well as how they were supposed to structure the data.

As stated in the Norwegian constitution of 17 May 1814, section 2 (Grunnloven 1814), evangelic Lutheran Christianity was the official state religion and all citizens had to practice

this religion[1]. Until the dissenter act of 1845 all Norwegian citizens were thus forced members of the state church, and so the church books contained more or less complete registers of the entire population. After the first dissenter act of 16 July 1845 (Dissenterloven 1845), citizens could terminate their membership in the state church and were free to start their own congregations. Membership in dissenter congregations freed individuals from fees to the state church under section 3 of the dissenter act, but although they were no longer members of the state church they were still required to be included in the church books. However, four and a half decades later the passing of law no. 1 of 27 June 1891 on dissenters—*lov angaaende kristne dissentere og andre, der ikke er medlemmer af statskirken*[2]—ordered organized dissenter congregations to keep their own registers of the births, weddings, and deaths amongst their members (Dissenterloven 1891). These records were to be sent to the magistrates annually, who were then to pass the records on to the state church clergy to be included in the church books. Dissenters who did not belong to any organized congregations were themselves responsible for reporting about births of children, marriages, and deaths of loved ones to the local vicar through the magistrates for registration in the church books. Apparently a number of the leaders of the dissenter congregations took this duty lightly and seldom or never reported their records to the magistrates even though this was required by law, and so the incompleteness of the dissenter records resulted in somewhat faulty church book records (Mykland 1997). However, when considering the low numbers of people who were not members of the state church – only 2,3 percent in 1900 (Statistisk sentralbyrå 2002; Breistein 2016) and 6 percent as late as 1970 (Statistisk sentralbyrå 2012) – the records can be considered relatively complete.

4.2 Birth registers

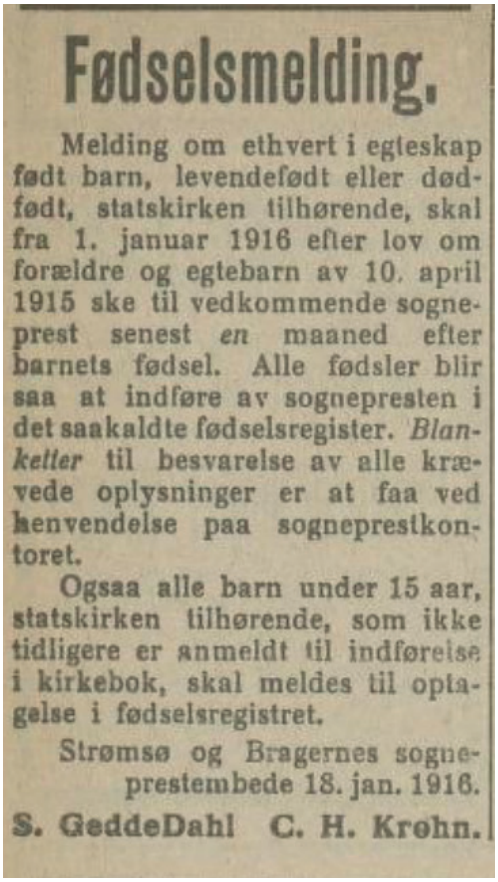
To ensure more complete collection of data on the population, law no. 6 of 10 April 1915 on parents and children—*lov om forældre og egtebarn*—ordered the establishment of birth registers (Barnelova 1915). Parents, midwives, or doctors were to report the birth of a child to the

1 Kongeriget Norges Grundlov, § 2: '*Den evangelisk-lutterske Religion forbliver Statens offentlige Religion. De Indvaanere, der bekjende sig til den, ere forpligtede til at opdrage sine Børn i samme. Jesuitter og Munkeordener maae ikke taales. Jøder ere fremdeles udelukkede fra Adgang til Riget*.'

2 English translation: '*Law regarding Christian dissenters and others, who are not members of the State church*'

local priest within a month of the birth, as stated in section 8 of the law[3]. The law sought to ensure the protection of children by the state (Vogt 1916), and the register was a means to ensure that all children were in the system. A regulation which put the law into effect through an order in council on 25 November 1915 ordered the clergy of the state church to keep birth registers in addition to the church books (see figure 4.1) (Fremtiden 20.01.1916; Trondhjems Adresseavis 06.01.1916; Wiesener 1916; Stavanger Aftenblad 02.01.1917).

The section for births in the church book would no longer be used. Instead births would be registered in 'a special birth register provided by the department of justice'[4] (Wiesener 1916:143). Just like data from the church books, birth register data was sent by the clergy to the magistrates on a regular basis. Since the clergy was already engaged and paid by the state to keep track of the population through the church books and report the records to the state, ordering them to keep this new register, which basically contained the same information in a new format, probably made sense both economically and administratively.



Fødselsmelding.

Melding om ethvert i egteskap født barn, levendefødt eller dødfødt, statskirken tilhørende, skal fra 1. januar 1916 efter lov om forældre og egtebarn av 10. april 1915 ske til vedkommende sognepræst senest *en* maaned efter barnets fødsel. Alle fødsler blir saa at indføre av sognepresten i det saakaldte fødselsregister. *Blanketter* til besvarelse av alle krævede oplysninger er at faa ved henvendelse paa sognepræstkontoret.

Ogsaa alle barn under 15 aar, statskirken tilhørende, som ikke tidligere er anmeldt til indførelse i kirkebok, skal meldes til optagelse i fødselsregistret.

Strømsø og Bragernes sognepræstembede 18. jan. 1916.

S. GeddeDahl C. H. Krohn.

Figure 4.1 Fødselsmelding
Announcement from the newspaper *Fremtiden* 20 January 1916 that every child, born alive or stillborn, was to be registered in birth registers kept by the local priest of the state church.

This arrangement continued until the early 1980s. The priests were released from their birth register duties as of 1 January 1983, when the responsibility for keeping the registers was moved to *Folkeregisteret*—the population register—as of law of 8 April 1981 no. 7 on children and parents (Barnelova 1981). On 18 September 1981 an announcement in the newspaper

3 Lov om forældre og egtebarn, § 8: '*Naar forældrene staar i statskirken, skal de senest en maaned efter barnets fødsel melde den til den geistlige embedsmand, som fører kirkeboken for sognet. Staar forældrene ikke i statskirken, gjælder de regler om meldingspligt, som derom er git. Den, hos hvem fødslen foregaar, skal sørge for, at den blir meldt. Ogsaa dødfødt barns fødsel skal meldes. Har et barn, naar denne lov træder i kraft, endnu ikke fyldt 15 aar, og er dets fødsel ikke tidligere meldt, skal den meldes senest et aar, efterat denne lov er traadt i kraft.*'

4 '*… fødselsanmeldelser herefter ikke at indføre i vedkommende avdelinger i den almindelige kirkebok, men i et særskilt fødselsregister, som nærmere anordnes av justisdepartementet*'

Aftenposten declared that priests 'will no longer need to keep birth registers. […] Also the Priest Association hopes that they will be relieved from parts of the marriage registration. As it is today the priests record all marriages, bourgeois and ecclesiastical' (Aftenposten 18.09.1981). It seems that priests found keeping the birth registers to be too much work, and were glad to hand this off to someone else.

4.3 Censuses

The first census in Norway was taken in 1769 (Statistisk sentralbyrå 1980). However, some regard the census of 1801 as the first census in Norway as it was the first nominal one, that is, the first one to record the name of each separate individual (Soltvedt and Statistisk sentralbyrå 2004:19). The census of 1769 had been the first one to include numerical data on the entire population, not only men.

The census of 1801 marked the beginning of an almost regular series of censuses all the way into the twenty-first century. After the next census in 1815, censuses were taken every 10 years until 1875, and then every ten years starting in 1890. However, the censuses from 1815 to 1855 were not nominal, leaving the censuses less than suitable as a source for data on individuals until the census of 1865, which included information about individuals once again (Ofstad 1948:465,466). The quality of each census was improved based on the weaknesses of the previous ones, and by utilizing new technology the processing of the data became easier and less time-consuming. Starting with the census of 1980 the data collected was processed using punch cards with information on each individual person (Ofstad 1948:468).

4.4 Population registers

The introduction of population registers happened gradually. First voluntary municipal registers were allowed, then they were made mandatory, and finally a national register was introduced.

4.4.1 Voluntary registers

The first law on population registers, passed 29 April 1905, opened up the possibility for city municipalities to establish population registers (Folkeregisterloven 1946). The establishment of registers was not mandatory, but rather voluntary. In the municipalities that did introduce registers the citizens were, according to section 1 of the law, required to submit information on name, occupation, residence, date of birth, place of birth, citizenship, and marital

status. All information about migration within the boundaries of the municipalities had to be submitted to the authorities (Soltvedt and Statistisk sentralbyrå 2004:162–163). The law also provided for annual municipal censuses, which made it easier to keep data on the growing population up to date. According to section 1, paragraph 2 of the law, landlords renting out property also had a responsibility to report information on their tenants. In some instances this led to incorrect information, as tenants may not have felt comfortable sharing detailed information with landlords, worrying that it might lead to gossip (Aftenposten 10.06.1943). Section 1, paragraph 3 of the law also legalised the performing of annual municipal censuses.

Folkeregistret.

I møde den 21 september d. a. har Kristiania kommunestyre i henhold til lov af 29 april d. a. om vedtægter angaaende folkeregistre besluttet **istandbringelsen af et permanent folkeregister for Kristiania** fra 1 januar 1906. De af kommunestyret i samme møde bestemte vedtægter er approberede ved den norske regjerings resolution af 18 oktober sidstl., hvorefter formandskabet under paafølgende 8 november har vedtaget et reglement for folkeregistret.

Folkeregistret skal ifølge dette reglement udarbeides paa grundlag af en **folketælling i Kristiania pr. kommende aarsskifte.** Til istandbringelse af denne er byens voxne indbyggere ifølge loven under bødestraf forpligtede til at bidrage ved at udfylde de folketællingslister, som vil blive uddelte og strax over nytaar atter indsamlede gjennem politiet. Disse lister vil være ledsagede af et til afrivning bestemt aftryk af vedtægterne samt af et uddrag af reglementet. Særlig skal man her henlede opmærksomheden paa at der fra 1 januar 1906 indtræder pligt for enhver i byen boende voxen person til for sig og sin husstand skriftlig eller mundtlig **at anmelde ethvert bopælskifte indenfor byens grænser** til folkeregistret hvis kontor er i Akersgaden 55, (den kommunale kontorgaard) indre gaard, aabent hver dag kl. 12—2 og 5—7. Folkeregistrets opgave er at holde rede paa, hvor enhver af byens indbyggere, voxne som børn, til enhver tid bor; pligten til at anmelde flytninger omfatter saaledes et hvilketsomhelst indenbys bopælskifte. Skriftlige anmeldelser kan ogsaa indleveres paa politiets bistationer, hvor blanketter udleveres gratis, eller til ligningsassistenterne, som ogsaa hver torsdag fra kl. 5—7 em. i sine privatboliger modtager mundtlige anmeldelser. Iøvrigt kan flytningsanmeldelser kjøbes i boghandelen for 1 øre pr. styk. (rabat for flere).

Indflytninger til Kristiania **fra andre kommuner** eller udflytninger fra Kristiania til andre kommuner **skal** som hidtil anmeldes til politiets flytningskontor (Nytorvet 5).

Kristiania Magistrat, 2den Afdeling, den 8 december 1905.

H. E. Berner.

(HO 720) G. Amneus.

Figure 4.2 Folkeregisteret
Announcement from the newspaper Aftenposten, 21 December 1905, about the establishment of a population register in the municipality of Kristiania (now Oslo).

Kristiania (now Oslo) was the first municipality to establish a register, on 1 January 1906 (see figure 4.2) (Aftenposten 21.12.1905). The way the register was organized was based on a register card system developed by Gustav Amneus, head of the Kristiania municipality statistics office. Amneus had studied the registers in Gothenburg, Copenhagen, and Stockholm, and came up with an innovative system utilizing register cards instead of books. Each register card contained information about one individual, making it easier to look up information on separate individuals (Soltvedt and Statistisk sentralbyrå 2004:163). This register was deemed effective in the way it registered citizens liable to pay taxes and simplified work tied to the many different censuses that the municipalities were ordered to keep, and it basically paid for itself (Soltvedt and Statistisk sentralbyrå 2004:164). However, few registers were established in other Norwegian municipalities before WWI.

By 1920 only 31 registers had been established in what were mainly medium-sized to large municipalities around the country. These included the most populous municipalities as well as municipalities experiencing a speedy increase in population size as a result of industrialization. The registers made the administrative work in the municipalities more effective, and helped keep track of the growing population (Soltvedt and Statistisk sentralbyrå 2004:164). The system had proven itself a useful tool for allowing a more accurate view of the population over time than censuses alone could provide (Soltvedt and Statistisk sentralbyrå 2004:163). Because population registers were established only in some municipalities, the registers did not reach their full potential. The problem was mostly tied to people moving out of municipalities with

registers to municipalities without registers, as reporting such movement was difficult. As a result, some municipalities organised annual municipal censuses to ensure the quality of the register data (Soltvedt and Statistisk sentralbyrå 2004:166).

4.4.2 Compulsory registers during World War II

While under German occupation during World War II, registers were established in all Norwegian municipalities. The German government already had a history of systematically registering its inhabitants for tax, military and school purposes before Hitler and the Nazis came to power, and under the totalitarian regime the national registration system became a tool for the surveillance and policing of individuals (Kempner 1946:362, 365). This surveillance and policing was extended to include the populations of Nazi-occupied states through the introduction of similar all-embracing national registration systems in these states (Soltvedt and Statistisk sentralbyrå 2004:172).

Folkeregistrering i alle landets kommuner.

Også midlertidig flytning fra en kommune skal meldes. — Lensmannens befatning med disse saker faller bort.

Loven om folkeregistre av 3. september 1942 som settes i kraft 1. mars i år, betegner det siste avgjørende skritt i den årelange diskusjon og i debattering om en ny folkeregisterlov som påbyr føring av folkeregistre i alle landets kommuner.

NTB. har ved henvendelse til myndighetene fått en orientering om disse spørsmål.

I 1905 ble det ved lov åpnet adgang til å opprette folkeregistre i byene, uten noe direkte påbud om å gå til et slikt skritt, og Oslo, sammen med etpar andre byer i landet, gikk fra 1. januar 1906 i gang med en kommunal folkeregistrering. En lov av 1915 åpnet adgangen også for landkommunene til å opprette folkeregistre, og etterhvert begynte de bymessig bebyggede landkommuner å etablere folkeregistre. Dette henger selvsagt nøye sammen med gateinndelingen, husnummereringen osv.

I 1920 ble det holdt et møte med 20 representanter for folkeregistrene rundt om i landet, og man ble da enig om å utarbeide forslag til obligatoriske folkeregistre i alle landets kommuner. Møtet resulterte i en komité som utarbeidet forslaget, men saken kom ikke videre. Samtidig ble saken om sivil registrering av fødsler, dødsfall og vielser utarbeidet, men heller ikke dette ble videre behandlet slik at vi fikk noen endelig lov. Tidligere var det kirken og politiet som førte de kommunale registre, men her var det så mange mangler og ufullstendige opplysninger at kravet om en ny lov om registrering ble sterkt støttet. Siden 1920 har saken ligget henlagt inntil oktober 1939 da rasjoneringen trådte i kraft og krevde en øyeblikkelig omlegging av registreringsvesenet. Det ble opprettet rasjoneringsregistre, samtidig som det ble satt i gang en såkalt rasjoneringstelling kombinert med en folketelling (av 7. oktober 1939).

Denne rasjoneringstelling var imidlertid ikke nok til å tilfredsstille alle krav om en kommunal folkeregisterføring, og Innenriksdepartementet tok derfor opp saken til ny behandling og resultatet er den nye loven som no settes ut i livet.

Loven om obligatorisk folkeregisterføring i alle landets kommuner bringer en helt annen orden i registervesenet enn tidligere har vært tilfelle. Meningen med loven er å gi kommunene et sentralregister for all slags personregistrering.

Tidligere har det vært slik at man i landkommunene gikk til lensmannen for å få utflytningsattest når man fraflyttet kommunen. Det var i det hele tatt ikke snakk om å melde fra, hvis man midlertidig tok opphold i en annen kommune. Lensmannens befatning med disse spørsmål faller no bort, og de egne kontorer som opprettes i kommunene for dette øyemed, bestyres av en registerfører som forestår den daglige ekspedisjon. I den nye loven heter det at midlertidig fraflytning som varer 30 dager eller mer, o g s å skal meldes av. Man henvender seg da til det kommunale folkeregister og får utlevert et såkalt oppholdskort som tjener som legitimasjon for fraværet, og leverer kortet til folkeregistret i den kommunen man tar midlertidig opphold i. Når så vedkommende reiser tilbake til sin bostedskommune får han kortet med seg og leverer det tilbake til det kommunale folkeregister. Det kommunale folkeregister skal således ha full beskjed om hvor lenge vedkommende har vært fraværende fra kommunen. Den praktiske fordel dette medfører skulde være innlysende, og folkeregistrene blir på denne måten langt mer nyttig også for publikum. Av landets 747 kommuner har bare 65 hittil hatt folkeregistre, derav 45 by- og ladestedskommuner.

Det er således en naturlig utvikling som her er skjedd. Den nye folkeregisterloven er laget på basis av de krav som har gjort seg gjeldende i kommuneadministrasjonen i de siste år-tier, og betyr en nyordning som vil bli til uvurderlig nytte for de kommunale registerføringer av alle slag.

Figure 4.3 Folkeregistreting i alle landets kommuner
Announcement from the newspaper *Aftenposten*, 23 August 1943, that all moves between municipalities were to be reported to the municipal population registers.

The Nazi-sponsored Norwegian government, led by Vidkun Quisling of the Nasjonal Samling ('National Unity') party, passed 'law'[5] no. 1 of 3 September 1942 on population registers, on orders from the German *Reichskommissariat*. Section 1 of this 'law' made the implementation of population registers compulsory in all municipalities[6] (*Norsk lovtidende*. 1942 1942:822; Soltvedt and Statistisk sentralbyrå 2004:172). The 'law' also required all migration, both permanent and temporary, to be reported to the local register (see figures 4.3 and 4.4) (Aftenposten 01.03.1943; Innenriksdepartementet 1943). Also, the official registration of marriages, births, and deaths was moved from the church to the population registers (Folkebladet for Sogn og Fjordane 26.03.1943). The responsibility of keeping church books and birth registers was handed back to the priests and pastors of the state church and dissenter

5 The law was repudiated after the war had ended, and is therefore referred to as a 'law'

6 'Lov' om folkeregistre, § 1: '*I hver herreds- og bykommune skal det opprettes folkeregister over enhver som er fast eller midlertidig bosatt i kommunen*.'

congregations after the war ended (Aftenposten 30.06.1945).

Registers were established in all municipalities as a result of the Nazi-imposed 'law', but since a lot of people did not want to share information about their whereabouts with the occupational authorities, they chose not to report to the registers when migrating between municipalities (Aftenposten 09.07.1945). Others did probably not have the time to report their movements, as they had to flee from their homes in a hurry and reporting the move was probably the last thing on their minds. As a result, a portion of the population was registered with an *'ukjent adresse'*—unknown address—until the end of the war, leaving the data incomplete (Aftenposten 09.07.1945).

Kunngjering.

Eikefjord herad har skipa folkeregister frå 1. mars 1943. Alle som flytter til eller frå eller innan kommunen pliktar å melda dette innan 3 dagar. Mellombels fråver eller opphald over 30 dagar skal ogso meldast. Likeeins alle fødsler, vigsler og dødsfall. Alle meldingar vert å senda Folkeregisteret, Eikefjord. Nærare ved oppslag.

Eikefjord herad, 15. mars 1943.

Leiv Vasset.

Figure 4.4 Kunngjøring: Meldeplikt
Announcement from the newspaper *Folkebladet for Sogn og Fjordane*, 26 March 1943, that all moves between municipalities as well as births, marriages, and deaths were to be reported to the municipal population registers.

4.4.3 Compulsory registers in all municipalities

After the war the church books, birth registers, and municipal population registers were supposedly in a poor state (Soltvedt and Statistisk sentralbyrå 2004:168), and the most obvious choice would probably have been to close and disavow the municipal population registers that had facilitated surveillance and policing of the population during the years of occupation. However, the system of mandatory municipal population registers was essentially continued after the war, while still maintaining a certain 'symbolic distance' (Soltvedt and Statistisk sentralbyrå 2004:169) from the Nazi-introduced system.

Population registers were made compulsory in all municipalities through law no. 2 of 15 November 1946 on population registers (Aftenposten 07.11.1946; Folkeregisterloven 1946). The proposed law did not cause much debate. Questions were raised about the hurried decision to essentially copy a law passed by the Nasjonal Samling government, and about how well the smaller and less resourceful municipalities would manage with the extra work that the introduction of municipal registers would mean (*Stortingsforhandlinger* 1945/46:610, 611). But these questions did not stop passage of the law. The law allowed for data from the census of 1946 to be used as a basis for the new municipal population registers. Statistisk sentralbyrå (SSB) was made their supervisory body and a central office for population registration was established within the bureau (Soltvedt and Statistisk sentralbyrå 2004:169). The administration of the

local population registers was subjugated to The Norwegian Tax Administration (Aurbakken 1999:39).

Statistisk sentralbyrå had been founded in 1876 under the name of *Det statistiske Centralbureau*. The bureau later changed its name to *Statistisk sentralbyrå* (Statistics Norway) (Statistisk sentralbyrå 2015). The bureau was essentially the same as the tabular office (*tabelkontoret*) previously mentioned in section 4.1; the changes in 1876 made it an independent institution and gave it a new name (Backer 1947:214). By 1946, Statistics Norway had been one of the advocates for the establishment of registers, driven by the desire for easier access to data and improved population statistics. The head of the office for population statistics within Statistics Norway at the time, Julie Backer, was involved in drafting the new law on population registers (Finansdepartementet 1946). The bureau's competence within data processing and involvement in and advocacy for population registers was most likely why Statistics Norway gained such a central role in population registration and was put in charge of the registers.

The instructions that were distributed throughout the country in 1946, specifying how the registers were to be kept, were quite inadequate. It has been suggested that the implementation of the registers and the drafting and passing of the law on population registers was rushed, and would normally have taken more time, but that it was pushed through so that the census of 1946 could be used as a base for the new registers (Soltvedt and Statistisk sentralbyrå 2004:169). Probably partly as a result of this rushed process, it took almost ten years before the registers had progressed from a chaotic state to a somewhat decent condition (Soltvedt and Statistisk sentralbyrå 2004:207). The organisation of the local registries varied quite a bit, and most were co-localised with other parts of the municipal administration. Most commonly the population registries shared offices with the tax authorities, but also with social security and the municipal treasurer, to mention a few (Soltvedt and Statistisk sentralbyrå 2004:170). Usually the registrar's main tasks were subjugated to whatever part of the municipal administration the registry was co-localised with (Soltvedt and Statistisk sentralbyrå 2004:171). Reports from Statistics Norway speak of very casual methods where, for example, a local tax officer had his 13-year-old son do a large portion of the registration work; another kept the register at home where his son did the work for 1 NOK per hour; and another kept the register in his own living room where his brother and wife helped with the workload. Besides this there were no restrictions as to who could be hired to work as local registrars (Soltvedt and Statistisk sentralbyrå 2004:170).

One might question why anyone would want to keep a system that had initially been introduced by an 'enemy' for surveillance, especially if it was in as poor a condition as reports suggest. Could it be that the system was actually not in such bad shape, but that the supposedly

poor conditions made it possible for Statistics Norway to continue the work with registers at the same time as a certain distance to the original system and its creators was maintained?

5 The national register and the national identification number

The idea of using identification numbers or serial numbers for distinguishing between individuals in registers was already well established in the private and public sectors when the question about introducing a national identification numbering system was posed in the 1960s (Bendiksen 1960:10). Many agencies and corporations were already using serial numbers to distinguish between individuals in their customer registers (Bendiksen and Selmer 1963:1). These serial numbers made distinguishing between individuals easier within each organisation or corporation, but the many different numbering systems that existed across organisations became a source of frustration (Aftenposten 16.11.1964). For example, the tax authorities in Oslo introduced a personal numbering system in 1959 for identification of individuals. The number included information about birthdate and would follow an individual from cradle to grave. As a side note, this was the first Norwegian identification numbering system to incorporate the birthdate in the identification number (Bendiksen 1960:9). However, what set this numbering system apart from most others was that it was not limited to internal use in a register. It was also used in reports from and in communication with individuals (Bendiksen 1960:10). It was thought that if this practice of outward use of personal numbers was to spread to other agencies, the use of one uniform numbering system would be preferable and an advantage to the public (Bendiksen 1960:10). The introduction of a national identification numbering system marked a shift from many numbering systems to one universal system.

5.1 Motives

In 1961–62 the Ministry of Finance received requests from trade associations that something needed to be done about the numerous identification numbering systems that corporations had to deal with when working with various public agencies for purposes such as tax estimation and social services (Skaug 1968:3). The use of separate serial numbers when working with different public agencies was inefficient and made administrative work a lot more time-consuming and difficult than necessary. Serial numbers were supposed to make it possible to use efficient new technologies—which at the time meant data processing with punch cards (Aftenposten 15.07.1966; Furseth, Ljones and Statistisk sentralbyrå 2015:24). However, the profusion of numbers limited these advances. The requests lead to consideration of introducing a unique number for every individual person (Aftenposten 27.07.1963; Karlsen, Skaug and

Statistisk sentralbyrå 1968:12). This eventually led to the introduction of a central population register (CPR) with the Norwegian name *Det sentrale personregister (DSP)*—the national register—and its 11-digit identification number, the *fødselsnummer*, in 1964. The Office of the National Registrar was a part of Statistics Norway through 1990, and was moved to The Norwegian Tax Administration on 1 January 1991 (Skiri 1994:8; Olderbakk et al. 2007:18). Det sentrale personregister changed its name to *Det sentrale folkeregister (DSF)* in 1995 (Soltvedt and Statistisk sentralbyrå 2004:160) in connection with a reorganisation of the system, and is today more commonly referred to as *Folkeregisteret* in everyday speech.

The requests from trade and industry may seem to have been the main motivation behind the introduction of Folkeregisteret and the fødselsnummer, but actually the idea of introducing one universal numbering system for all dealings with the state had been around for a while already when the trade associations brought their frustrations to the table (Aftenposten 10.11.1959). Statistics Norway had their own reasons for breathing life into a national identification numbering system. A CPR database and a universal numbering system would have the potential to improve statistics on individuals. Also the fødselsnummer would become an important component in Statistics Norway's establishment of what they called *det arkivstatistiske systemet* (the 'archive statistical system'). This last motivation was, however, not clearly articulated until the early 1970s, by a committee authorized to review the use of the population registers (Seip 1975:113). The archive statistical system was based on the idea that the interconnecting of different registers held great potential for improving the keeping of statistics on individuals (Soltvedt and Statistisk sentralbyrå 2004:173). Data could be gathered continually and processed when needed, without concerns about the data collection process (Furseth, Ljones and Statistisk sentralbyrå 2015:26). The hope was that a national registry with a central register would be a source for large sets of data that could produce increasingly more accurate and advanced statistics and research at the same time as it would make administrative work more effective.

5.2 The fødselsnummer

The new national identification number was assigned to all individuals who were born in Norway or had immigrated and taken residency in Norway (Skatteetaten n.d.-b). Little about it has changed since its introduction in the 1960s.

The number consists of 11 digits. The first six digits indicate the birthdate in the form DDMMYY. Following the birthdate is a three-digit individual number, followed by two check digits (Selmer, E. S. 1964:36, 37), so the full number is in the form DDMMYYIIICC (for an

example, see figure 5.1). The third digit of the individual number denotes gender, with even numbers for females and odd for males. The two check digits at the end of the number were added to prevent potential errors, including both input errors and incorrectly supplied information. The algorithm used for generating and validating the check digits was developed by professor and mathematician Ernst S. Selmer at the request of Statistics Norway (Selmer, E. S. 1964:37).

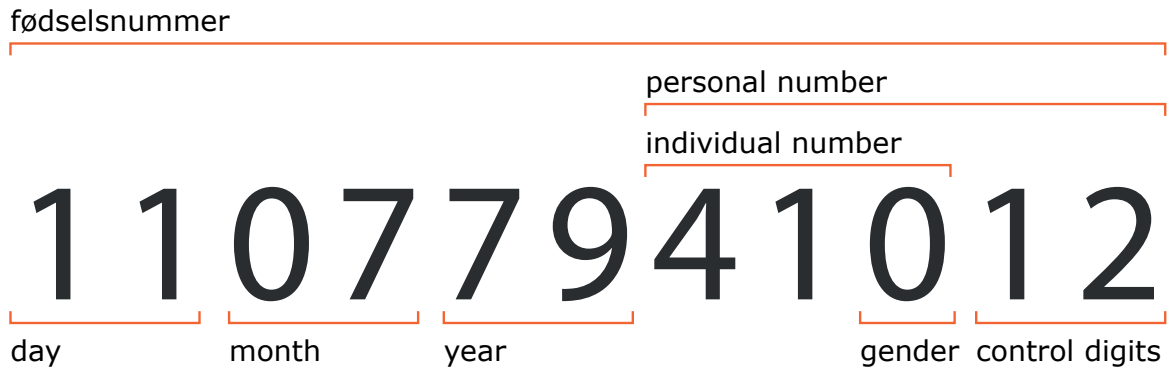


Figure 5.1 The construction of the fødselsnummer
Redrawn from Furset, Ljones and Statistisk sentralbyrå (2015:25).

The inclusion of the birthdate may seem to explain why the number received its name (fødselsnummer means birth number), but if it was so, a more natural name would probably be '*fødselsdagsnummer*' (birthdate number). Another explanation could be that it was a result of the time when the system was introduced, pointing to the fact that the rate of immigration in Norway was very low at the time of the number's introduction, and so most identification numbers were assigned at birth, hence the name 'birth number' (Vassenden 2016:105).

One of the reasons why the birthdate was included in the number was that it was thought this would make it easier for individuals to remember their number. People would already know their birthdate and would only have to memorize the last five digits of the number (Bendiksen 1960:10; Selmer, E. S. 1964:44). The order of the elements within the birthdate was based on how people were used to citing them: first day, then month, and finally year. This decision was based partly on experiences with the Swedish numbering system, where the birthdate was given in the opposite order, starting with the year and ending with the day: YYMMDD. Because this order did not reflect the way people were used to saying their date of birth many Swedes tended to misstate their identification number (Selmer, E. S. 1964:37). The first six digits of the Norwegian fødselsnummer do not include the century of birth, but a

system for encoding the century was built into the design of the three-digit individual number. However, this system was imperfect, as we will see later.

The three-digit individual number was designed with the size of the population and the maximum number of births on any given day of the year in mind. At the time, the highest number of births on a single day had been approximately 250, in the spring of 1946 (Selmer, E. S. 1964:36). The individual number space was also divided into different series to differentiate between people born in different centuries. Individual numbers 000–499 were used for individuals born after 31 December 1899, and the series 500–749 for those born before 1 January 1900 (Karlsen, Skaug and Statistisk sentralbyrå 1968:18). Although it seems that the designers of the numbering system thought it slightly optimistic that the system would last into the twenty-first century, the series 750–999 was reserved for those born after 31 December 1999 (Skaug 1968:4). The designers may have been onto something when they assumed their estimations for the numbering system were could be wrong. Because of immigration and other factors, the 750–999 series of numbers had to be utilized a bit earlier than intended; for certain dates between 1940 and 1999 there were not enough individual numbers in the 000–499 series for the growing Norwegian population, and so numbers from the 750–999 series had to be used instead (Nystadnes 2010:7).

5.3 Technological dependencies in the design of the fødselsnummer

The folkeregister and the fødselsnummer were designed on the assumption that data would be processed using punch cards. Apart from the example set by the already well-established Swedish national identification numbering system, the birthdate was included in the Norwegian personal identification numbers for reasons of efficiency. A punch card from the 1960s (see figures 5.2 and 5.3) could hold only a limited amount of information, and including the birthdate in the identification number eliminated the need for a separate field for the birthdate (Furseth, Ljones and Statistisk sentralbyrå 2015:24). Another rationale for including the birthdate seems to have been that it allowed for data to be sorted more easily.

The idea of using letters instead of numbers was also considered as an alternative for the construction of the individual number. This would have required using only two letters as opposed to three numbers. But because of difficulties that this would cause in the mechanical data handling, the idea was dismissed as too inconvenient (Skaug 1968:5).

The algorithm for calculating the two check digits at the end of the number was not just mathematically but also technologically constrained. The punch card machine used by

Statistics Norway at the time was made by IBM, and so the characteristics and limitations of IBM's control equipment were an important part of the premises for the design of the check digits (Selmer, E. S. 1964:37,38).

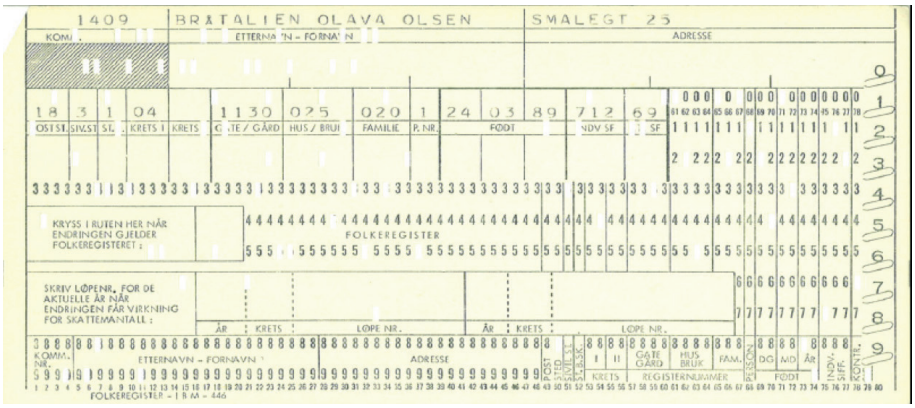


Figure 5.2 Used punch card from the 1960s
(Furseth, Ljones and Statistisk sentralbyrå 2015)

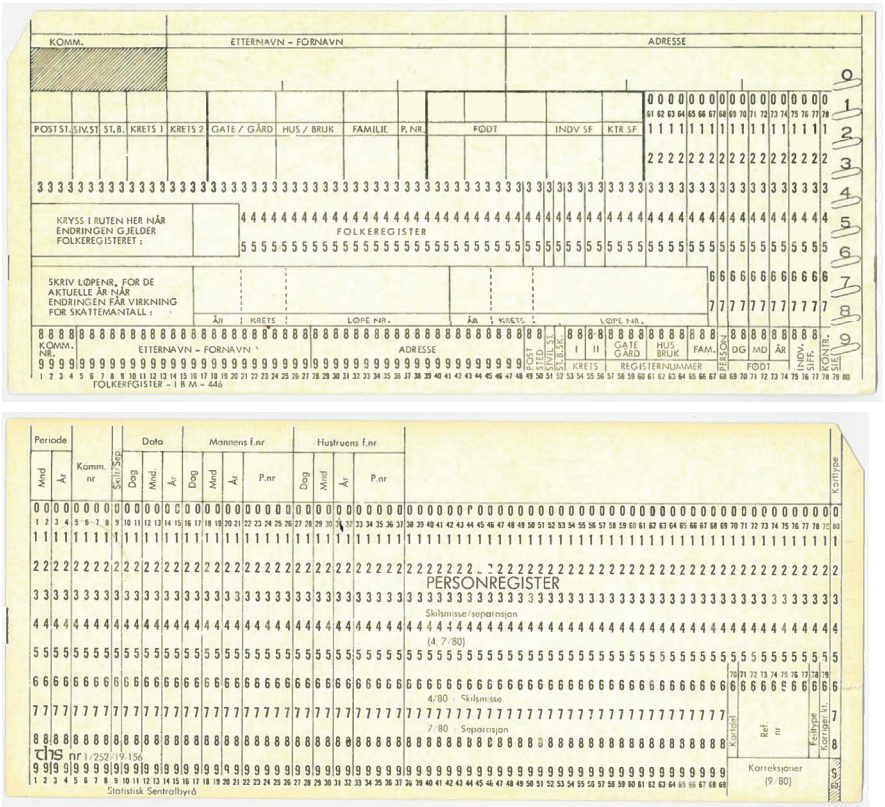


Figure 5.3 Unused punch card from the 1960s
Both sides of an unused punch card from Folkeregisteret

The number of check digits was also decided on based on registration practices and technology. The registration and use of the fødselsnummer was done 'offline' without any direct access or connection to the population registers (Skatteetaten 2015). Because of the potential

number of errors that might occur due to information that was wrongly recorded, an effective control mechanism was imperative to ensure the quality of the information in the system. Calculations done by Selmer showed that using just *one* check digit would leave too many errors undetected. *Two* digits on the other hand would reduce the number of undetected errors from 50 per 100,000 to 1 per 100,000 (Selmer, E. S. 1964:7).

5.4 Familiarizing the public with the fødselsnummer

The new central population register and the fødselsnummer were introduced together to the public as a rationalization measure for the larger registers. The use of one serial number per individual in all dealings with public agencies would, it was said, ease administrative work. A statement made by a representative of Statistics Norway involved in the work with the new number, Bjørnulf Bendiksen, assured the public that the system 'in its initial stage would not make a difference to the population'[7] (Aftenposten 27.07.1963).

Members of the public learned their own individual fødselsnummer in November 1964, from cards issued by Statistics Norway (Aftenposten 28.10.1964). The numbers were printed on tax deduction cards for the first time in 1967 (Pedersen 1968), marking the start of the number being used in tax administration. The unfamiliar number on the tax deduction cards probably made some people wonder. It seems that not all had been able to grasp what the numbers were for. Newspapers around the country picked up on this and offered help by explaining the number was and its purpose. *Nordlands Avis* wrote on 10 February 1967 that the 11-digit number printed on tax deduction cards 'that might seem a bit mystical to some' was 'simply a serial number […] in other words our identification number' (Nordlands Avis 10.02.1967). The Directorate of Taxes also made sure that all parts of the population were given information about the number prior to its release. A notice with the title *'Nytt løpenummersystem 1967'* (new serial number system for 1967), dated 12 August 1966 (Skattedirektøren 1966), was printed in local newspapers across Norway giving a short briefing on the upcoming numbering system and explaining that it would soon be used for taxation and state services.

5.5 The D-number

In the mid-1980s an alternative number to the fødselsnummer was introduced for people who were taxable but did not qualify to receive a fødselsnummer: the D-number (*D-nummer*)

7 Aftenposten 27 July 1963: '*Byråsjef Bjørnulf Bendiksen i Statistisk sentralbyrå, som har ansvaret for opplegget, forteller til NTB at ordningen i første omgang ikke vil berøre publikum.*'

(Skatteetaten and Referansegruppen 2011; The Norwegian Tax Administration n.d.-a). The number was originally introduced in order to process the earnings of sailors on Norwegian ships liable for tax in Norway (Skatteetaten and Referansegruppen 2011:13). Opinions differ as to where the 'D' in the name 'D-nummer' came from, but two prevailing explanations appear: one is that the 'D' is an abbreviation of the English word 'dummy' in the sense of 'stand-in' (Skatteetaten and Referansegruppen 2011:13) and the other is that the 'D' is an abbreviation of *Direktoratet for sjømenns 11-sifrede registreringsnummer* (the Directorate for Sailors' 11-digit registration number) (Strand and Statistisk sentralbyrå 1996; Furseth, Ljones and Statistisk sentralbyrå 2015). As the Norwegian Tax Administration explains it today, D-numbers are assigned to people who do not have a fødselsnummer and who are not resident in Norway, but have a justifiable need, such as:

1. being liable for tax and national insurance in Norway
2. having an account with a Norwegian bank
3. having an account at the Norwegian Central Securities Depository (VPS)
4. receiving national insurance benefits from Norway
5. owning property in Norway
6. holding a position in a legal entity or for other reasons being registered in the Register of Business Enterprises or the Register of Mortgaged Movable Property

(Skatteetaten 2017)

The D-number is constructed the same way as the fødselsnummer and consists of 11 digits. The first six digits denote the date of birth, the following three make up the individual number, and the last two are check digits. What differentiates the D-number from the fødselsnummer is that the first digit of the birthdate is increased by four. Thus the D-number of a person whose birthdate is the second day of the month would start with '42' instead of '02' (Strand and Statistisk sentralbyrå 1996:4).

If a person holding a D-number later qualifies for a fødselsnummer, the D-nummer is replaced by the fødselsnummer (Skatteetaten and Referansegruppen 2011:16). This change of numbers denotes an individual's new status as a Norwegian resident in Folkeregisteret.

5.6 The numbering system in use, 1964–2017

The fødselsnummer's areas of use have expanded over time in pace with developments in technology and society. The introduction of the fødselsnummer in 1964 took place without statutory authority (Kjær 1977:213; Selmer, K. S. 1992). A proposal for a new identification system was made and passed in 1962, but it had not specifically mentioned a numbering

system, and therefore the members of parliament were not aware of having authorized the introduction of a national identification number as a part of the sytem (VG 11.03.1995). As a result there were no official regulations about how the register and its associated identification number could be used. Only in 1970 did the system acquire statutory authority, through the act on population registration, dated 16 January 1970 (Folkeregisterloven 1970), which established the basis on which the register and number could be used. In 2016 a new law (Folkeregisterloven 2016) which would replace the act on population registers of 1970, was passed. As we will see later (in section 7) this new law and the modernisation programme that it resulted from may lead to a change in the way the number is used. At the time of writing (May 2017), this new law has not yet taken effect.

5.6.1 From a strictly administrative tool to a personal tool for identification

Although there were examples of serial numbers being used in communication with numbers, not everyone was convinced that individuals would need to know their fødselsnummer by heart when it was introduced in the 1960s (Skaug 1968:8). The number was printed on tax deduction cards and was used only in the administration of the largest public agencies, such as the Tax Administration, the National Insurance Service and the Directorate for Sailors, but also in some other, smaller administrative registers (Skaug 1968:8). Today most Norwegians can state their number without hesitation. The number is used for identification at the doctor's office and the pharmacy, just to mention a few places, and as a username when logging in to online banks and online portals providing access to public services (more about this in section 6.2).

5.6.2 A key that connects information

Although the technology utilized by the registers has changed, the core function of the fødselsnummer—a key that connects information—is the same today as it was in the 1960s. The fødselsnummer is used within various registers, where it functions as a key to information about an individual. Its use within the CPR database is not visible to the public, but undeniably facilitates the seamless flow of information tied to a specific individual into the national register and out again to public and private users of the system. Thus Folkeregisteret receives birth information from midwives and doctors, and name and address change information from private persons. The registered data is then redistributed from CPR database to the tax authorities, election authorities, and other public authorities such as the police, fire department, NAV (social insurance system), and the Norwegian armed forces, as well as to Statistics Norway, banks and insurance companies, employers, scientists, private organisations and

private persons (Skatteetaten n.d.-a). The fødselsnummer serves to tie together all the different information registered in connection with an individual, and essentially becomes a key to the information on each person.

In the everyday lives of Norwegian residents, thanks to the fødselsnummer's function as a key, this means that the number is suitable as a means for identification in all public services. When you state your number to your doctor, the pharmacist or in a tax form, the number unlocks the same (or nearly the same, depending on the access to information from the CPR; see section 6.4) information in all registers.

5.6.3 From manual to automatic registration and updating of data

The organisation of the registers started out based on punch card technology. Based on reports from the local population registries about births and immigration, numbered cards were sent from the CPR to the local population registries once a month. These cards were returned to the CPR with the necessary information about individuals (Skaug 1968:7). The manual registration and transfers of data between the registers exposed the system to potential input errors, making the two check digits of the fødselsnummer a necessity for error control.

Given the way information from the CPR is registered and updated today, the check digits have somewhat outlived their role as tools that ensure correct data. Most register databases that receive information from the CPR do so automatically and electronically through a distributor (explained in more detail in section 6.4). Since there is little manual input of the fødselsnummer in the system, the number of potential errors is very low compared to what it was in the first few years of the CPR and the fødselsnummer, and the need for two check digits is not as great as it was in the first few years of the CPR and the fødselsnummer. This does not mean that there is not need for error control in the fødselsnummer any more. However, cutting down from two to one check digit would make sense in more ways than one. The presence of check digits limits the information capacity of the number (Finansdepartementet 2017:5), but moving from two check digits to one could increase the information capacity of the number.

5.6.4 Printed on documents

Since its introduction to the public in 1967, the fødselsnummer of the individual in question has been printed on most official documents and letters from the tax authorities. Also, employment contracts and paychecks are required to include the fødselsnummer so that tax can be correctly applied (Datatilsynet n.d.). Certificates issued by the state such as birth certificates, marriage certificates, transcripts, and diplomas from educational institutions also have the

fødselsnummer printed on them. The fødselsnummer is found on both Norwegian passports and driver licenses. For a while Norwegian banks issued debit cards that also functioned as proof of identity, and included personal information such as name and fødselsnummer, but in 2012 many banks stopped issuing these. The reason was partly that the cards were too easily forged, and partly that the banks saw issuing of identification cards as the government's responsibility, not theirs (Njarga 2014).

5.6.5 A 'secret' number

Although the fødselsnummer is meant to be used to identify individuals, *Datatilsynet* (the Norwegian data protection authority) recommends that people do not give their number to someone 'unless there is a justifiable need for secure identification of a person and the fødselsnummer is necessary to achieve this' (Datatilsynet 2013). As a result, most Norwegian organisations and corporations assign separate numbers to individuals for internal identification, although they do list the fødselsnummer of these individuals in their registers. Students attending Norwegian universities and colleges do not have their fødselsnummer printed on their student cards, but rather a separate student number. This is not because the universities do not have access to the fødselsnummer from Folkeregisteret, but because the use of the fødselsnummer for identification at universities and colleges is not regarded necessary or justifiable.

Many Norwegian citizens are under the impression that the fødselsnummer should be kept secret and that it is strictly confidential information. People tend to believe that apart from themselves, only public authorities and those that they have shared their information with will know their fødselsnummer. The number is not, however, considered confidential or sensitive personal information by the authorities. The misconception that the number should be kept secret may be the reason why it is believed by some to be suited for use as an authenticator, or password (Olderbakk et al. 2007:41, 90). This use of the number as an authenticator has in turn made it more sensitive, and subject to theft and misuse.

5.6.6 An authenticator

It seems that many people have had an unclear understanding of this difference between identification and authentication. The fødselsnummer, has sometimes been used as an authenticator for confirming individuals' identity, and thereby simplifying and shortening application processes. Thus the number has been used as an authenticator in application processes for changing an address, for setting up new bank accounts, and for telephone subscriptions. Also, identification documents such as birth certificates could previously be ordered by supplying

just a name and fødselsnummer. This misguided use of the fødselsnummer made identity theft quite easy for criminals, until the Norwegian Center for Information Security (NorSIS, *Norsk senter for informasjonssikring*) and Datatilsynet started a campaign in 2007 that aimed at stopping the use of the fødselsnummer for authentication rather than for identification of individuals (Høie 2011).

5.7 Debates on the numbering system

A curiosity about the Norwegian national identification numbering system is that it was introduced without any public debate. Rather its construction and introduction was an anonymous, administrative process within Statistics Norway, commissioned by the Ministry of Finance in 1961 (VG 11.03.1995). The proposal for the new identification system did not lead to any discussion in the Norwegian parliament either, and was passed in 1962 without specifically mentioning of a numbering system (VG 11.03.1995).

5.7.1 One universal number or many different ones

One of the main questions prior to the introduction of the fødselsnummer was not about whether numbering systems should be used in Norway or not. According to Bjørnulf Bendiksen (1960:10), who was involved in the work on the new identification numbering system, it was rather a question about whether there should be one number or many different ones[8]. Although this did not become a matter of public debate, it is worth mentioning. Numbering systems were already being used by organisations, agencies and corporations in their own registers, but the use of different numbers across systems that needed to communicate with each other was rather impractical (Bendiksen 1960:10).

5.7.2 Privacy issues

The way the number was introduced to the public in the media in the 1960s was as a numbering system that would make things easier in dealings with all parts of the public sector (Nordlands Avis 10.02.1967) and as a tool for making administrative and statistical work more effective (Pedersen 1968). Safety was not a major concern, and 'privacy protection' and 'information security' were still not common terms in the 1960s. Other than potentially disloyal employees at the registers, people did not seem to eye any possible threats that might send their personal information astray (Pedersen 1968). What people seemed to worry more about

8 *'Problemet er jo ikke ett nummer eller intet, men ett nummer eller mange.'*

was being reduced from an individual to a mere number (Pedersen 1968).

Although there was not a public debate about the privacy issues tied to the construction of the new national identification number in the early 1960s, Statistics Norway did discuss an alternative to the birthdate based number—an eight-digit serial number without any built-in personal information (Aurbakken 1999:40). Since the alternative was voted down, it seems that including personal information in the number was not considered much of an issue. Although this meant individuals had to share personal information, information that might not be advisable to share, whenever they were being identified, the practicalities of the birth-date-based number weighed heavier.

In 1970s, debates on privacy protection picked up. The growing use of interconnected registers and the wide distribution of data tied to individuals led to questions about what rights and what kind of protection the registered individuals deserved. The debate resulted in a law (Personregisterloven – pregl. 1978) that regulated the use of data containing personal information, the fødselsnummer in particular (Aftenposten 27.06.1979).

6 Current status and implications

6.1 Digitization

The everyday lives of people have changed in many ways since the 1960s and the introduction of the national register and the fødselsnummer. 'Everything' is being digitized and made available online. The Norwegian system for population registration has moved from local, manual registers (1946–64) through a digital central register and a select number of digital local registers (1964–ca. 1990) to fully digitized and integrated registers (1993–) (Skiri 1994:8). The national register is now stored on rewritable media and is no longer limited by the characteristics of punch cards. Today Folkeregisteret is important to nearly all public administration and planning that involves individuals, and it is of great importance to medical research and all other research involving people (Statistisk sentralbyrå 2017). Scientists do not receive access to the fødselsnummer, but the number is imperative in the way it ties together the information that is issued to research. The fødselsnummer is a key element in making the intricate system of interconnected registers as seamless and effective as possible, by connecting data from different register databases to each individual person.

The system was established prior to the 'digital age', and the laws concerned with population registration that regulate it date from 1970 (Folkeregisterloven 1970). They do not cover issues tied to IT as we know it today. Because guidelines for its use have been poor or entirely lacking, the use of the the numbering system has been stretched in directions that, in hindsight, may not have been advisable. One of these questionable usages is the use of the fødselsnummer as an identifier in online banks. As the practice was not stopped, the number is still being used in online banks today, and has through this become a key to people's financial data, making the number much more sensitive information than it was ever intended to be.

This practice dates from 1995, when the Norwegian data protection authority approved the use of the fødselsnummer as an identifier when logging in to online banks. Eleven years later, however, the same authority questioned the lawfulness of the practice, asking Norwegian banks to document their need for the use of the fødselsnummer in online banks (Solli 2006). This request was based on the law on personal data (*Personopplysningsloven 2000*), section 12. The section regulates the use of the national personal identifier, and says that using the number requires that there be an objective need for the identification of an individual and that

the use of the fødselsnummer is necessary for such identification[9]. The banks defended their approach and were allowed to keep using the fødselsnummer as an identifier in their online banks. Had this practice been suggested in 2009 instead of in 1995, though, the Norwegian data protection authority would have tried its best to prevent it (Aftenposten 18.03.2009).

6.2 Online identifier/username

With the internet and the introduction of online portals for various state services as well as the birth of online banking, the fødselsnummer got a new use: as a username for logging in to access these services. Today, in addition to its use in Norwegian online banks, the number is used for logging in to *Vigo.no* (the Norwegian high school admission service) and *Samordnaopptak.no* (The Norwegian Universities and Colleges Admission Service) when applying for admission to a high school, college or university. *Brønnøysundregistrene* (The Brønnøysund Register Centre) also runs a web portal, *Altinn.no*, where the public can make reports to a number of different public agencies and again the fødselsnummer is used as a username. In addition to these a number of other online state services, frequently used by Norwegian citizens, make use of the fødselsnummer as a username. All of these can be found through norge.no, an online guide to digital services from Norwegian state agencies, counties and municipalities. The portals facilitate digital communication between public authorities and Norwegian citizens. Digital communication is supposed to make the everyday lives of the

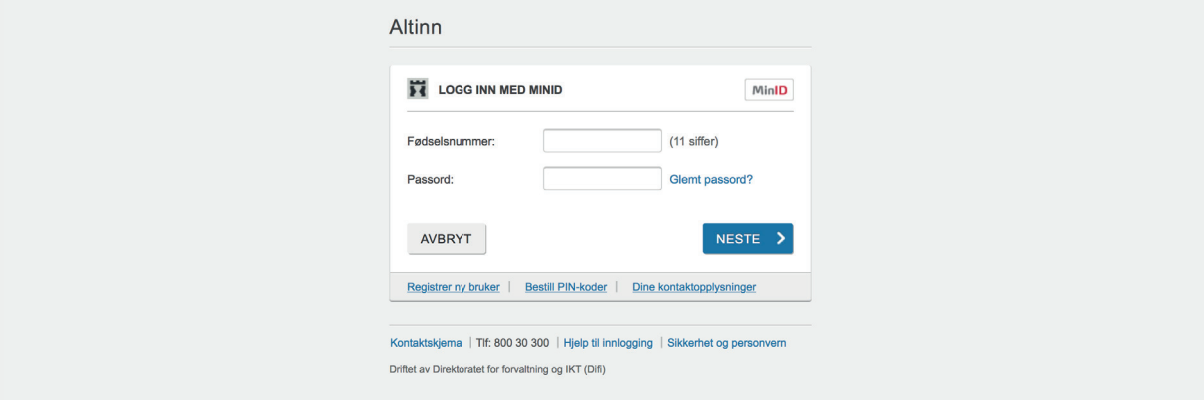


Figure 6.1 The fødselsnummer as a username
Logging in to altinn.no requires use of the fødselsnummer as a username

9 Lov om behandling av personopplysninger 14.04.2000, § 12: '*Fødselsnummer og andre entydige identifikasjonsmidler kan bare nyttes i behandlingen når det er saklig behov for sikker identifisering og metoden er nødvendig for å oppnå slik identifisering.*'

Norwegian citizens easier and public services better and quicker (Direktoratet for forvaltning og IKT (Difi) 2016).

Digital communication between public authorities and citizens was made possible by the Norwegian e-government regulations (e-forvaltningsforskriften 2014), which came into force on 7 February 2014. Today the online services are probably where Norwegians use their fødselsnummer most actively. People are not used to saying their fødselsnummer out loud very often, but entering it in text format to access state services has become very normal. The fødselsnummer is only being used as an identifier within these services, with a separate authentication process (see figure 6.2). Some of the authentication processes require users to submit a combination of a personal password and a one-time password received through either SMS, smartphone applications, or special code-generating devices supplied by the Norwegian banks.

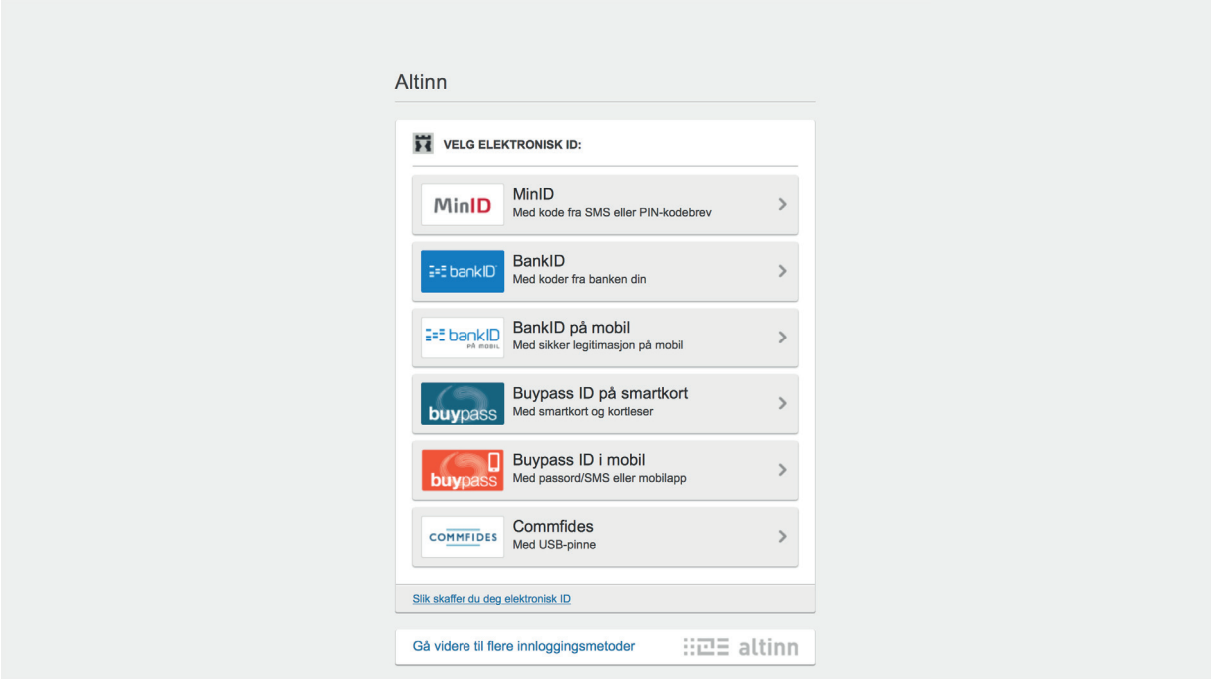


Figure 6.2 Methods of online authentication
The screenshot shows the different means of authentication used in order to log in to Altinn.no, all of these methods include a use of the fødselsnummer as a username.

6.3 Assigning numbers

Assigning the fødselsnummer and D-number to individuals is today carried out by a central unit within the Norwegian Tax Administration (Olderbakk et al. 2007:20). The fødselsnummer is assigned to children born in Norway after Folkeregisteret has received a notification of birth from midwife, doctor or mother. Also, immigrants who have been granted Norwegian

citizenship report to Folkeregisteret to receive their fødselsnummer from the central unit.

Although one of the main reasons for using identification numbers is that a number need not change and can last a lifetime, a part of the population receives a second number which replaces the number they were originally given. This happens for various reasons: An individual may initially have been assigned an incorrect number, showing the wrong gender or birthdate; an individual may have changed her juridical gender; or an individual may have been assigned with a fictitious identity through an identity protection programme. By 1966, two years into the life of the fødselsnummer, 140,000 numbers (not including D-numbers, as they were not yet introduced) had been corrected due to wrong information (Skaug 1968:7). Since then the control routines have improved, and numbers are not replaced as often any more. By 10 April 2017 the number had risen to 214,249; only 288 of these were from 2017 (see appendix 1). Replacing a number with a new one can cause disorder in the registers, and has in some cases resulted in doublets—the same person registered twice, with both a D-number and a fødselsnummer or with both a new and an old fødselsnummer (Skatteetaten and Referansegruppen 2011:16).

An identification number can only be assigned once. If it has been assigned, it will not be reused for a new individual, even if the original assignee has died or emigrated (Skiri 1994:8; Vassenden 2016:119).

6.4 Data flow and distribution

The data stored in the central population database kept by Folkeregisteret is reported by a mix of private individuals and public agencies (see figure 6.3 for examples). After checking and updating the database its data is then distributed to individuals, agencies, corporations, and organisations with a justifiable need for access to personal information from the national register. The data is, however, not distributed directly from the CPR database to all of its users. Some agencies, including Statistics Norway, receive information directly from the CPR, but most consumers receive information through an external distributor (see figure 6.4 for some examples) (Vassenden 2016:19).

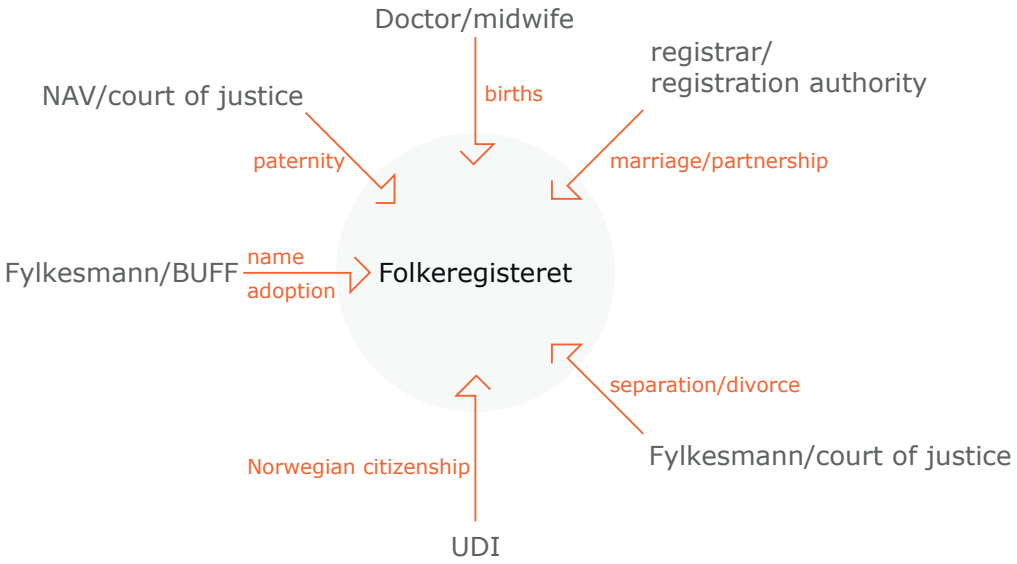


Figure 6.3 Data flow into Folkeregisteret
Some examples of data reported to Folkeregisteret from various actors. Simplified version of figure from feasibility study by Vassenden (2016:20)

Electronic distribution mostly takes place through a distributor who is chosen based on competitive tendering (Olderbakk et al. 2007:22). EVRY, one of the leading IT corporations in the Nordic countries, was awarded the most recent contract, effective from 1 January 2015 (Evry 2015). This company has in fact performed as distributor for more than 30 years (Larsen 2012:1). This outsourcing builds on a principle that input and output functions should be clearly separated, meaning that the CPR database should be a tool for updating, while distribution should be handled by separate distribution registers (Vassenden 2005:6).

Anyone who wants access to information from the central registry must go through an application process. The application is reviewed by the Tax Inspectorate, which approves or rejects it and determines the terms of the permit (i.e., what data will be distributed). The needs

of the user (whether an organisation, corporation, or private individual) must be backed up by statutory authority in order for access to the register to be granted. After approval, the user must register with the distributor in order to gain access (Skatteetaten and Referansegruppen 2011:26).

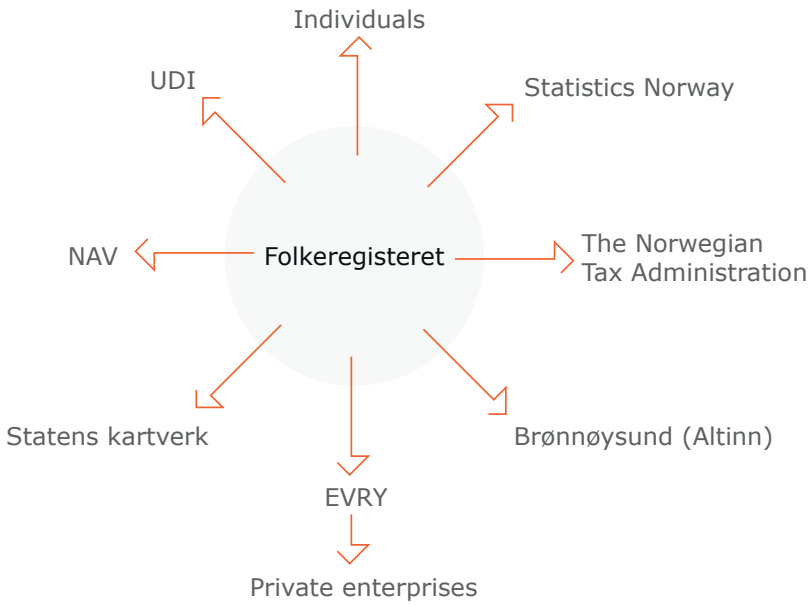


Figure 6.4 Data flow out from Folkeregisteret
Some examples of actors who receive information from Folkeregisteret. Simplified version of figure from feasibility study by Vassenden (2016:20)

The kind of data private individuals, private enterprises, and public authorities can apply for access to differs. As a general rule private individuals can only obtain information about themselves, but if certain confidential information is needed in order to fulfil statutory rights or obligations, information about other individuals may be disclosed. The data that may be obtained by private individuals includes full name, date of birth, personal identification number (fødselsnummer), residential address or postal address, and date of death when applicable (The Norwegian Tax Administration n.d.-c). Private enterprises with a justifiable need for information may apply for information from the folkeregister, including the same kind of data that private individuals may obtain, in addition to information about registration status (resident, emigrated, deceased) (The Norwegian Tax Administration n.d.-b). Public authorities may obtain data from the folkeregister if the information that is wanted is 'necessary in order for the authority to perform tasks that are incumbent on it pursuant to an act of parliament or a regulation'. Information from the folkeregister that may be disclosed for public authorities include full name (and name history), date of birth and personal identification number, place of birth, residential address, postal address, children, spouse or registered partner, marital

status (and marital status history), registration status, and date of death (The Norwegian Tax Administration n.d.-d). Summing up, the data that the different user group can get access to varies according to need and authorization, but the fødselsnummer is in theory accessible to all of them.

All recipients who receive data through the distributor must pay for the service (handling and updating of data), according to the act on population registration (Folkeregisterloven 1970) section 14, last paragraph, and the regulations on the act on population registration (*Forskrift om folkeregistrering*), sections 9-3 and 9-4. The actors who receive data directly from the CPR database do so at no cost, but are responsible for the handling and updating of the data themselves.

6.5 Restricted amounts of data in Folkeregisteret

When the CPR was first introduced, punch-card technology restricted the amount of data it could register in connection with an individual. Today, although technology allows registering much more information, the law on population registration (Folkeregisterloven 1970) still restricts what kind of information the CPR database can keep about an individual. Although modern technology would allow more information to be stored in the register, protection of individuals' privacy seems to weigh more heavily.

A report by Olderbakk et al. (2007) on the current situation of Folkeregisteret and proposed future changes to Folkeregisteret suggested registering more personal information, including electronic contact information. Communication between public authorities and citizens in Norway relies increasingly on electronic channels, and so the report suggested that e-mail address and cell phone number should be included in the register (Olderbakk et al. 2007:65). Not everyone agreed; a commentator in the newspaper Dagsavisen (Plesser 2008), under the title '*Utrygge fødselsnummer*' (Unsafe birth numbers), looked at this idea from a privacy protection point of view and claimed that the report's proposals would make the fødselsnummer less safe and more of a bother than a convenient tool.

6.6 The identification number as an information carrier

Information about gender and birthdate is built into the fødselsnummer, making it an information carrier, or what Nöth (1990:209) calls a significant code—a code that gives information about the content that it represents. With the rise of transgender issues, the necessity of this significance has been questioned. The need for the number to carry information about gender is,

according to investigation by the Norwegian Tax Administration, minimal. To some agencies gender information is irrelevant, and to those for which gender is relevant, it is not imperative that the information is embedded in the number itself (Finansdepartementet 2017:12). Also, the technology utilized today does not require significant codes for simple sorting of data, as opposed to the technology the fødselsnummer was developed for in the 1960s.

Although there is no technical need for gender information in the fødselsnummer, respect for the individual probably weighs more heavily as an argument for the removal of the information from the number. The problem is not only that the fødselsnummer forces a gender label upon people who may not identify with either of the two traditional genders. The significant code also adds complexity to the process of changing juridical gender, as a change of gender requires an individual to change his or her fødselsnummer to one that communicates the correct gender information.

Gender information is not the only information that the fødselsnummer encodes. The birthdate makes up a prominent part of the number. Its presence in the number does not seem to bother Norwegians, in contrast to those in other parts of the world where someone's date of birth is considered information too personal to be included in an identification number. However, it has been suggested by some that the presence of the birthdate in the fødselsnummer may be contributing to confusion about the national identification number's role, and that a non-significant code would be less likely to be mistakenly considered suitable as an authenticator (Finansdepartementet 2017:8). Another thought is that people may be more accepting of a more open use of the personal identification number, like the way Icelanders use the kennitala, if it does not communicate personal information such as date of birth (Olderbakk et al. 2007:68).

The date of birth and gender are the two most obvious pieces of information that one can derive from a Norwegian identification number, but there is one more identification carrier to be found in both the fødselsnummer and the D-number. The first digit in the identification numbers reveal whether an individual is a resident or a non-resident. Residents are assigned with a fødselsnummer, while non-residents are assigned with a D-number, where the value '4' is added to the first digit of the birthdate. Much the same as in the case of juridical gender, the

residential status of an individual may change. A change from D-number to fødselsnummer signals the change of residential status in the registers where it is being used.

6.7 The fødselsnummer as a universal key

The role that the fødselsnummer plays in public administration acts that relate to individuals, and its status as an identifier, make it one of the most valuable possessions that Norwegian citizens own. The folkeregister and the fødselsnummer are an important part of the infrastructure of Norwegian society, as other commentators have also pointed out (Skatteetaten and Referansegruppen 2011:13). The identification number is an important part of a functioning welfare state, and ensures an individual's rights to welfare and public services.

The fødselsnummer is used in order to tie personal information to an individual in a number of statutory tasks. These include the reporting of information about wages and pensions, reports from banks and financial institutions to the Tax Administration, proceedings tied to the social welfare system, the registration of personal information in health records, statistical work, preschools, schools, and nursing homes, and the registration of fines and fees imposed by the police or customs (Finansdepartementet 2017:4).

Within health care and medical research the fødselsnummer has given Norway an advantage compared to countries where citizens are not assigned with unique personal identification numbers. The fødselsnummer has facilitated the collecting of unique health data for more effective health services and medical research (Widerberg 2017). Also, after the *e-resept* (electronic prescription) replaced the traditional paper-based prescriptions in 2014 (Dagsavisen 29.04.2014), the fødselsnummer became a tool for retrieving prescribed medication. A person in need of prescription medication leaves the doctors office without any physical evidence of a prescription, but knowing that an electronic prescription has been issued she simply states her fødselsnummer at the pharmacy and the pharmacist retrieves the correct prescription from the database. To ensure that the correct person is issued with the prescribed medication, pharmacy staff is required to ask for proof of identity from customers whom they are not already familiar with (Direktoratet for e-helse 2014).

The number has become something that most Norwegians take for granted and don't really give much thought to in their everyday lives. Having a number means that you have a legal identity in the register and that you are in the overall system, and most dealings with public services and agencies go smoothly because of the number that connects you to your personal information. In a welfare state that relies on a national identification number to reduce administrative work, having a number means you are 'in'. Not having one or only

having a temporary, alternate one, like the D-number, means you are not 'in', or at least only 'in' to a certain degree.

The fødselsnummer is any Norwegian's key to accessing public services. Without it you must settle for expensive services from private businesses. The D-number is supposed to give EU citizens the same rights to health services as Norwegian citizens, at the expense of their country of origin. But because patients without a fødselsnummer generate more paper work than those with a fødselsnummer—work that doctors cannot be bothered with—some D-number holders are not benefiting from the health care system as they should in theory (Stærk 2017). The D-number can be regarded as something of a second-rate identification number.

6.8 Identification, not authentication

The fødselsnummer alone is not meant to be used as an authenticator of identity. The process of authenticating the identity of an individual requires the use of identification documents (Datatilsynet 2013). The misconception discussed in section 5.6.4, that the fødselsnummer can validate the identity of an individual, has led to misguided uses of the number. This, in turn, has made it easy for criminals to assume the legal identities of others. The misguided use of the fødselsnummer derived from a misconception of the fødselsnummer's purpose, and it is not unreasonable to suggest that the consequences of the misguided use have only fueled people's misconceptions of the number. Many people believe their number is confidential and should be kept secret, a sensible conclusion if knowing someone else's number suffices to be able to represent oneself as them. However sensible it may seem, this view of the number is (as noted in section 5.6.4) not correct. The Norwegian data protection authority regards the number as personal information, but not as sensitive or confidential information (Datatilsynet 2013).

7 Proposed changes to the ID number

As Norwegian society has changed and developed, the use of data from the CPR database and the associated fødselsnummer has expanded in both private and public sectors and is now central to many aspects of public administration and planning. However, the system is not meeting the expectations of its modern users in terms of data quality, accessibility, and cost-efficiency. In 2004, two independent reports proposed upgrading the national register (Arbeidsgruppe nedsatt av Arbeids- og administrasjonsdepartementet 2004; daVinci Consulting AS 2004). Both reports speak of a need for coordinating information technology strategies in the public sector, and describe the current situation and a future target situation for the exchange of personal data in Norway. Based on these reports as well as hearings on a note about distribution of data from the national register, the departments of modernisation and finances (*Kommunal- og moderniseringsdepartementet* and *Finansdepartementet*) commissioned the initiation of a modernisation programme for the national register (Moderniseringsdepartementet and Finansdepartementet 2005).

A workgroup of representatives from central public agencies was put together to initiate the work specified by the commission. Some of the key objectives of the workgroup were to map out needs and requirements for data, define objectives for Folkeregisteret, and to suggest and justify changes in laws and regulations (Olderbakk et al. 2007:7). The work resulted in a report on the exchange of basic personal data (Olderbakk et al. 2007) which defined the main objectives of the national register as collecting, storing and distributing personal data, assigning a unique identifier to every person registered in the register, and contributing to safe and cost-efficient interaction with and within the public sector (Olderbakk et al. 2007:12). In order for the register to keep assigning a unique identifier to every person in the future, the workgroup recommended updating or replacing the identifier.

In another stage in the process, the most important users of the register were involved in reviewing the conclusions from the first report and identifying new user needs (Skatteetaten and Referansegruppen 2011). This part of the modernisation programme can be seen as having taken a user-centered approach to the development of a new national register. The insight from the users of the system provided valuable information for a new and better design, but as with all state-provided services budget is an important determinant in most decisions, and so the best solution to a problem from a user perspective may not always win. A combination of considerations (users, technology, price, etc.) were considered through a feasibility study, which recommended that a vision for the future of the national register should be based on

a continuation of the existing model with substantially improved functionality, rather than a completely new model (Skatteetaten 2013:2).

7.1 A number in need of change

The use of unique identifiers in a large information system like the register makes looking up and discerning one entity from another more accurate and less time-consuming than having to rely on a combination of information such as name, birthdate and address. There seems to be agreement, in all the reports written in connection with the modernisation programme, that the fødselsnummer is an important tool that adds to the value of the national register and is worth keeping. At the same time, there are certain weaknesses to the number as is, and for a new number to successfully accompany a new and improved national register well into the future these weaknesses must be dealt with sooner rather than later.

7.1.1 Limited lifespan

The way the fødselsnummer is constructed, including birthdate and information about gender as well as two check digits, limits the number of possible combinations of identification numbers that can be assigned to people. This, of course, means that the fødselsnummer as we know it has a limited lifespan, and at some point in time there will be no valid combinations left. The same is true for the D-number. The fødselsnummer series is expected to last until approximately 2040 (Regjeringen.no 2017), and the D-number is likely to start running out of valid combinations in 2030 (Finansdepartementet 2017:13). Removing information from digits that carry information will expand the capacity of the numbering system. This will imply a change in the control routines of the databases where the numbers are used.

7.1.2 Instability

As discussed in section 6.3, the fact that the fødselsnummer itself is an information carrier that discloses the birthdate and gender of a person is making it unstable. For a more stabile numbering system it would be advisable to remove some or all of the information decoded in the number.

7.1.3 Misguided perceptions

The misperception that the number is suitable for use as a PIN code is facilitating identity theft. This misperception must change so that these consequences cease. The number should rather be thought of like a customer number, and should not be used for authentication. The

misperception is common among the public as well as in organisations, corporations and public agencies. The report by Olderbakk et al. (2007:91) suggests that if the fødselsnummer is made publicly available, and accessible to anyone without having to state a particular need for it, like in the Icelandic and Swedish systems, the perception that the number is suitable for authentication would be likely to change, and the risk of misuse would be lessened accordingly. The picture of the first page in Olderbakk's passport on the front page of the report illustrates the authors' belief in the benefits of an open system (see figure 7.1).

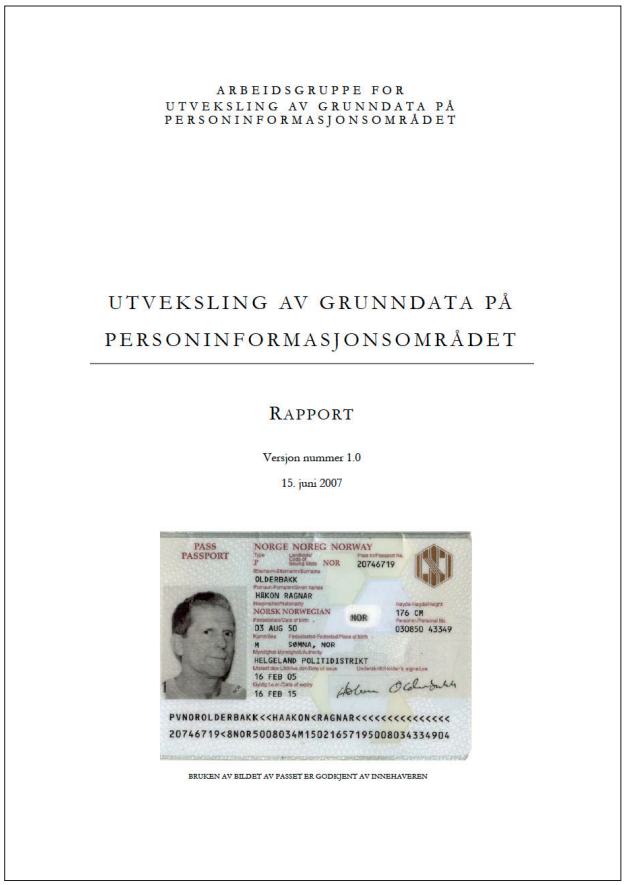


Figure 7.1 Olderbakk report with passport on front page

7.2 Developing a new numbering system

Through the modernisation programme 40 different alternatives to the current numbering system have been considered and narrowed down to six alternative solutions (Finansdepartementet 2017:7). These were presented in a consultation document submitted by the Ministry of Finance on 23 March 2017 (Finansdepartementet 2017; Hovland 2017). Three

absolute requirements were set for a new personal identifier:

1. Enough capacity in the number space to last the population until at least 2150.
2. A unique personal identifier for each person.
3. The identifier must comply with current regulations for privacy and security.

In addition to these absolute requirements, four additional but not equally important criteria were given:

1. low implementation risk
2. high degree of usability
3. good control routines (for errors, usually in the form of check digits)
4. coexistence with other numbering series (the possibility to use the new personal identifier alongside the current personal identifiers in the registers)

(Finansdepartementet 2017:5).

The alternative solutions presented in the consultation document can be divided into two categories: identifiers which carry information and identifiers which do not carry information (in Nöth's terms, significant and non-significant codes). The first group, the identifiers which carry information, are argued for on the basis that they are user-friendly and easy to remember, reduce the number of mistakes and errors, are more cost-efficient, give quick access to vital personal information like date of birth and gender, and require less change from the current system.

The identifiers which do not carry information are argued for on the basis that they have an increased stability and robustness to withstand change, have a high capacity, do not include information on age or gender, are compatible with fundamental privacy principles in that the identifier does not carry personal information. The lack of personal information in the number is also thought to make it clearer that the identifier serves purposes of identification

and not authentication; the presence of personal information in a number seems to confuse some individuals into believing that it can serve as a tool for authentication.

7.2.1 Six probable solutions

After a thorough consideration of the 40 different solutions, six alternatives were presented as probable solutions:

- Alternative 1 – the current numbering system with changes to the check digits.
  - Alternative 1a – identical with the current system except the first check digit is 'released', becoming a part of the individual number.
  - Alternative 1b – like alternative 1a but ceasing to encode gender information in the identifier.
- Alternative 2 – Alphanumerical and carrying information. Unlike the current numbering system in that the three individual digits can be both numbers and letters (alphanumerical signs). Those who already have a fødselsnummer when the new system is introduced can keep their old number.
- Alternative 3 – an 11-digit number not carrying any information.
  - Alternative 3a – when new numbers are introduced, people who already have a fødselsnummer get to keep it.
  - Alternative 3b – new identifiers not carrying any information are assigned to the entire population.
- Alternative 4 – Alphanumerical customer number with eight digits, not carrying any information. This would require the entire population to change to a new number.

In addition to these six alternatives, the alternative of keeping the current system as is (alternative 0) was also considered. However, the consultation document argues against this

alternative, as the system will run out of possible combinations (Finansdepartementet 2017:9, 10).

The alternative systems were ranked according to their ability to meet the requirements mentioned earlier. The effects of the different alternatives were judged in three ways:

1. The expected importance that the initiatives of an alternative will mean to society
2. The expected impact by the initiatives of an alternative on developments in society
3. Consequences to society compared to alternative 0

(Finansdepartementet 2017:12)

7.2.2 The new proposed numbering system

As with most projects, in the redesign of Norway's personal identifiers price is an important factor. The different alternatives were ranked according to cost. Alternative 1a (identical with the current system except for the release of the first check digit, which would become a part of the individual number) had the lowest expected cost. Alternative 4 (an alphanumerical customer number with eight digits, carrying no information, which would require the entire population to change to a new number) had the highest cost (Finansdepartementet 2017:11). Independent of the cost, alternative 4 was ranked as the best one, but considering all factors, cost included, the Directorate of Taxes recommended alternative 1b as the best alternative. This is identical with the current system except the first check digit is released and gender information is no longer encoded. This solution is expected to improve privacy as well as the robustness of the number in the future (Finansdepartementet 2017:13). Norway will gain a single and truly unique identifier for each and every citizen, and introducing the new system will not require any effort from the public, who will not have to learn a new number. Omitting gender information will make the process of juridical gender change smoother as individuals who change juridical gender will no longer need to change numbers (Finansdepartementet 2017:14).

8 Comparing the fødselsnummer with systems in other Nordic countries

The ties between the Nordic countries are quite tight in many regards. Many of our traditions are similar or even the same across borders. We share history and tend to think very much alike and to look to each other for inspiration, at the same time as we most definitely make our own distinct marks on things as separate and independent nations. The Nordic national identification numbering systems are good examples of this.

8.1 A code-based approach for establishing personal identity

> *'the nature of a social setting and the expectations held by the people in it are of crucial importance in defining what are acceptable techniques of identification at any point in time' (Higgs 2011:39)*

The Nordic countries have national databases where information about an individual is tied to a unique identification number—a code-based approach that does not rely on the use of physical documents. Before the introduction of databases, records of people were physical documents and so the process of identifying an individual meant linking the individual to one of the various basic documents about her, like a birth certificate or passport. This is still how identification is approached in countries where databases with associated identification numbers do not exist.

In Norway today, the identity of an individual is tied to a unique number that ideally follows a physical person from birth to death. This number is entered into public and corporate databases, where it serves as a key to information about the person, and as a tool for a code-based approach to identification. When we talk about identity we often talk about identification and authentication. Identification is essentially the process of pinpointing or singling out an identity. In Norway today, identification typically means pinpointing the identification number and the information it 'unlocks'. It may also mean pinpointing a set of attributes of the person that is felt to identify that person uniquely enough. These attributes may, for instance, be birthdate and address. Authentication, on the other hand, is the process of establishing

beyond doubt that an actual person taking part in an interaction is really the person who has a certain identity.

In their everyday lives people often find themselves in social situations where they need to identify, but not necessarily authenticate, themselves. The most basic way of being identified is through your physical attributes, such as eye colour, facial shape, hair colour, the way you walk, or the sound of your voice. People who know you identify and recognise you this way without thinking (such as friends, family, colleagues, teachers, and so on). With a code-based approach for establishing personal identities people do not need to carry around physical identification documents to identify themselves. When at the doctor's office in Norway people usually identify themselves by stating their name and birthdate for the doctor to locate and read or add new information, perhaps a prescription, to their health records. The relationship between the patient and the identity (records) is then assumed, but not authenticated.

Alongside Norway, Sweden, Iceland, and Denmark all take a code-based approach to the identification of individuals. All these countries rely on national registers and national identification numbers for identification of their citizens, but their exact practices vary slightly.

8.2 Openness

Tied to the code-based approach to identification is, in some cases, considerable openness in the use of an identification numbering system. For some reason, though, users of the Norwegian national identification numbering system have come to assume that the fødselsnummer is something that should be protected and kept secret. The Norwegian system started out with the intention that it would serve as a tool for identification of individuals, but the misunderstanding of its role has caused it to be used as a tool for authentication, further fueling the perception that the number should be kept secret.

The different Nordic systems present opposite poles in the openness of their identification systems. On the one side, the Icelandic and the Swedish systems are very open. Icelanders use their kennitala almost like an alternative name (Watson 2013:133), and there is no sense of secrecy to its use, which is very different from what Norwegians do. The Icelandic number is used to identify individuals in a wide range of social settings, connected to both private and public services. When calling the electric company for information about a recent bill, or calling the local sports club to register a kid for a swimming course, Icelanders identify themselves by stating their kennitala. The numbering system is simply regarded a tool for identifying individuals in an efficient manner. Something that might be considered a bit more unusual is Icelanders' willingness to write their kennitala on petitions open for anyone to see (Watson

2013:139). Swedes use their personal numbers much in the same way as Icelanders, but do not stretch their use as far writing the numbers out in public and leaving them for anyone to see. A parliamentary motion reviewed and passed by the Swedish parliament in February 1993 (Justisdepartementet 1993) states that 'the number is first and foremost to be used as a tool for identification of individuals'.[10] In line with this directive, Swedes state their personal number to identify themselves in a variety of social situations, from appointments at the doctor's office to renting videos at the local video rental (Hägg 2002).

In his article on the Danish numbering system Krogness (2011) calls the Danish population's attitude towards their CPR number 'casual'. The number appears on pay slips and diplomas, and people state their personal number frequently in everyday interactions, for example at the optician's. The CPR number is however, like the Swedish number, not used as openly as the Icelandic kennitala.

According to Watson (2013:138) Icelanders experience a rather low level of identity theft compared to other countries, and the openness of the system is likely to thank for this; because the kennitala is public information open to all, there is really nothing to steal. In Sweden and Denmark, on the other hand, an increasing number of identity thefts have caused more scepticism towards the open and casual use of personal numbers. The Norwegian system has basically been caught up in a vicious cycle of assuming that the fødselsnummer needs to be protected. Now that the fødselsnummer is being redesigned, it has been suggested that the number should be used more openly as a measure against identity theft. Of all the different systems it seems that the complete openness of the Icelandic system might be the best defence against identity theft, and that the rest of the Nordic countries should aim for consistency in their practices by moving from their partially closed and partially open style of use to a completely open style.

8.3 Design process and reforms

Sweden was the first of the Nordic countries to develop and implement a national system for personal identification numbers, introducing the personnummer (personal number) on 1 January 1947 (Skatteverket 2007). When the rest of the Nordic countries were developing their own systems the designers of these numbers naturally looked to the Swedish system for inspiration. Iceland introduced its first national identification numbering system in the early 1950s (Watson 2010:51), while Norway and Denmark followed suit in 1964 and 1968

10 'Personnumret används framför allt som hjälpmedel vid identifiering av personer'

respectively (Krogness 2011:105).

Although the different numbering systems must have to some extent benn inspired by the Swedish system, the processes that brought the systems to their current states differ between the countries. The Norwegian number has remained unchanged since its introduction in 1964, and because of its limited capacity, it is now in need of a redesign. Apart from a check digit added to the Swedish personnummer in 1967 its design has been maintained the same way since inception (Skatteverket 2007:1). Just like the Norwegian fødselsnummer, though, the Swedish personnummer is now experiencing a capacity problem and the number of possible combinations is starting to run out (Örstadius 2016). Thus far the problem has been resolved partially through a reuse (reassigning) of select numbers. In 2007 14,800 Swedish national identification numbers had been reused (Statistiska centralbyrån 2007:17), which is a contrast to the no-reuse policy of the Norwegian system.

When compared to the rest of the Nordic systems, the Icelandic numbering system went through changes relatively early on before adopting its current structure. The 8-digit birthdate-based number called the 'birthdate number' was the first to be taken into use in Iceland. A check digit was later added to the number and a new name-based number, the 'name number', was introduced and used parallel to the birthdate number to allow for the alphabetical sorting of data (Watson 2010:57, 58, 63). These two numbering systems were not robust enough and were both replaced in 1987 by the 10-digit birthdate based number, the kennitala, which is still used today (Watson 2010:69).

The 10-digit Danish personnummer/CPR number, also based on people's birthdates, was introduced in 1968 and was the last of the Nordic numbering systems put into operation. One would think that having well-established systems in other countries as models would have its advantages, but in 2007, the tenth digit of the Danish number lost its role as a check digit in order to expand the capacity of the system (CPR-kontoret 2009:22).

What seems to have influenced the changes in all the different numbering systems are exhaustion problems, the introduction of new technology, and the mistakes and successes of neighbouring countries.

8.4 Birthdate and century included in identification number

The birthdate is a central part of the Norwegian fødselsnummer. The same can be said about the other Nordic numbering systems as well. Birthdates were initially included in the Nordic national identification numbers to facilitate easy sorting of data in the national registers. They

also make the numbers easier for individuals to memorise than random compilations of digits.

The Swedish personnummer encodes the date in its first six digits in the form YYMMDD, whereas both the Icelandic kennitala, the Danish CPR number and the Norwegian fødselsnummer show the birthdate in their first six digits as DDMMYY. The Swedish way of using the date in the personal ID number made the system prone to error. The YYMMDD order did not correspond to with the way Swedes were used to saying their birthdate, and hence people's personal numbers were often misstated. The formatting of the birthdate was not chosen with people but rather technology in mind, as the order of year, month and date was supported easier sorting of data (Selmer, E. S. 1964:37). From what I have read it seems that Norway, Denmark, and Iceland chose to format the birthdate to correspond with the way people were used to saying their birthdates, based on the experiences of the Swedish system.

Seeing as the birthdate does not include information about century in any of the numbers, the problem of distinguishing between centenarians and infants has been dealt with in other parts of the number. This is done in different ways in the various systems. The Swedish system does not denote century in a direct sense, but rather includes information on the age of an individual by including a dash (-) after the birthdates of individuals less than 100 years old and a plus sign (+) for individuals 100 years old and more (Skatteverket 2007). The three-digit serial number following the birthdate in the Danish CPR number denotes the century of birth. The Norwegian fødselsnummer uses a model similar to the Danish number where specific intervals of the three-digit serial number following the birthdate correspond to specific time intervals. The Icelandic kennitala denotes century of birth with its tenth digit.

A downside to the inclusion of the birthdate in a numbering system is that it limits the capacity of the numbering system. The Danish and Norwegian models have both had problems with limited capacity, and reserved intervals of serial numbers have therefore been utilized earlier than planned. The Swedish system too is running out of numbers, and has so far resolved the problem by assigning numbers with incorrect birthdates (Örstadius 2016).

Some people believe an individual's birthdate is information too personal to be included in anything such as an identification number, and in some countries the practice is completely unheard of (Watson 2010:69). The wide acceptance of the birthdate-based numbers in the Nordic countries, on the other hand, suggests that people in the Nordic countries do not consider the birthdate sensitive information, and when looking at the state of the different

systems, it does not seem likely that the birthdate will be omitted from any of the systems in the near future.

8.5 Gender information in the identification number

The representation of gender in the national identification number is a feature common to almost all the Nordic countries. In the Swedish personnummer, the ninth digit is odd for men and even for women (Folkbokföringslag 1991). The Danish CPR number denotes gender in the same way in its tenth digit (Krogness 2011:105). The Icelandic kennitala, on the other hand, does not include information about gender. As of today the Norwegian fødselsnummer denotes gender in its ninth digit in the same way as the Danish and Swedish numbers, but the recent modernisation proposals have considered the issue of including of gender information and have found it unnecessary and too problematic to keep in the system in the future (Finansdepartementet 2017).

In Sweden, starting in 2013, several parliamentary motions have proposed removing the gender information in the personnummer (Wallén 2013, 2014, 2015; Hannah 2016; Wallén 2016). As of today these proposals have not led to changes in laws regarding the numbering system.

Transgender issues are more prominent today than before, and it is therefore natural to take into account that including gender in the national identification number is problematic for a part of the population. Some people undergo juridical change of gender, and some people might identify neither as male nor female and using a system that only distinguishes between the two traditional labels may feel discriminating to these individuals. An identification number is meant to be constant and follow an individual from cradle to grave. When an individual changes his or her juridical gender, having gender information designed into an identification number logically demands that the number be replaced by one that corresponds with the new juridical gender. The inclusion of gender information in the identification number is thus incompatible with the idea of a constant identification number.

Iceland does not denote gender in its number, and Norway is likely to end the role of the gender digit in their number. Transgender issues may not concern the majority of the population, but they are nonetheless a real problem. Not including gender information in an identification number makes it more stable and robust. Seeing as attention has already been

called to the issue a number of times in Sweden it is probably just a question of time before the Swedes follow the examples of Iceland and Norway.

8.6 Conclusion

Just like the national identification numbering systems of Sweden, Denmark and Iceland, the Norwegian fødselsnummer is a result of a design process, a process based on deliberate choices made by designers guided by their context in time and place. Designing effective identification numbering systems rely on and require insight into a mix of factors, including user needs, data properties, technology, and privacy protection.

Interaction designers regard user needs as a core factor in the design of good interactive systems. Although the initiative behind the development of Folkeregisteret and the fødselsnummer was based on request from users of the system, the initial design process cannot be said to have been user-centered. Still, the fact that people's cognitive capacity was considered in the construction of the fødselsnummer shows that the designers understood that the success of the system to some extent depended on the abilities and understanding of the system's users. Users and their needs and expectations change, and the continued success of an information system like Folkeregisteret and its associated fødselsnummer depends on the ability to adapt to these changes.

The fødselsnummer was designed with certain uses in mind. It was first and foremost meant to serve as a tool within public and private administration and there was likely not anyone in the 1960s who could have foreseen that individuals would come to use their fødselsnummer as actively as they do today. Today the people who are labeled have also become an important user segment, and consequently the design of the fødselsnummer is of an even greater importance today than what it was 50 years ago. If an individual is to memorize her number, the number's logic and length should make this as easy as possible. The proposed new personal identifier will maintain the visual traits of the fødselsnummer, although some of its logic will be removed. Not only is this the better choice economically speaking. It is also the better choice because it will be easy for people to memorize, and hence easy to use.

Labeling people is not quite the same as labeling books in a library. One of the main differences between them lies in the qualities of that which is being labeled—people. People are not constant, information about them may change, and the changes are not necessarily easily predictable. A book, once printed, remains the same. Designing a labeling system for people means designing for privacy protection and for certain types of changes in the data itself. All

four national identification systems presented in this thesis show the importance of understanding the properties of the data that is being labeled.

The construction and form of the Norwegian fødselsnummer and the rest of the Nordic numbering systems may to some seem obvious and almost predestined. They contain information about the individuals that they represent, so one might think that the form was discerned from the data it would encode. To some extent this assumption is understandable, especially in the way the different numbering systems give information about birthdate and gender. The likeness in the representation of the information between the four identification numbering systems described might make it seem like representation of birthdate and gender information can only be done in a couple of different ways. Both gender and birthdates can be represented in an indefinite number of ways, however, so the assumption might not be so correct after all.

Just like the human mind and the properties of the data, technology lays down opportunities and limitations for the design of an information system, but it also changes over time. The fødselsnummer was designed to be used with the technology available in the 1960s. With developments in technology the premises for the identification number have changed. The two check digits in the fødselsnummer that once were a necessity to avoid errors in the identification number are no longer as important. With the new technology that allows for automatic routines for updating and registering of data, one check digit should be enough. By including the first check digit in the individual number, the proposed future identification numbering system is making two adjustments: making the most out of the technology available and meeting the needs of a growing population.

Out of the four Nordic countries included in this paper, Norway seems to experience the greatest rise in identity thefts. Identity theft is not a new phenomenon, but predates the use of identification numbers. Criminals have assumed the identities of others for as long as there has been something to gain from it. Its rise over the last few decades can probably be explained by external factors to some extent, such as the rise of asynchronous, non-face-to-face computerized transactions all over the developing world. Looking at the situations in Denmark, Iceland, Norway, and Sweden there seems to be a relationship between the way identification numbers are used and the increase of identity theft. The more open the use, the smaller the rise in identity theft. This makes it seem like the misguided tendency in Norway to keep the fødselsnummer secret might be part of what is increasing the risk of identity theft.

The history of the Norwegian national identification numbering system is the history of a design process. The form and use of the numbering system may have been guided by experiences from other systems, by technology, laws, user needs, and even culture. These factors are

however not decisive for how a system is formed. They are guidelines, and someone, some designer or designers, must make decisions based on the premises that these factors lay out. A given set of premises does not force a single predetermined solution. The success of any design ultimately depends on the designer's ability to combine relevant knowledge about the context of its use with creative decisions that adapt the design to the changes that it may face.

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Appendix 1

Fødselsnummer-changes from 1964 to 10 April 2017.

Data received in e-mail from Kåre Vassenden, Division for Population Statistics, Statistics Norway on Friday 26 May 2017.

'G' denotes changes in gender information, 'B' denotes changes in birthdate information, and dash '-' denotes changes in the personal number but no change to either birthdate or gender information.

Frequency	--	-G	B-	GB	Total
1964	14 102	3 385	99 091	144	116 722
1965	2 202	381	4 854	8	7 445
1966	3 793	623	14 841	28	19 285
1967	1 693	219	3 520	14	5 446
1968	647	202	2 586	9	3 444
1969	1 010	169	3 116	10	4 305
1973	4 164	689	13 127	32	18 012
1981	1 537	731	6 797	32	9 097
1984	498	394	2 627	16	3 535
1986	125	186	864	5	1 180
1987	131	202	789	5	1 127
1988	66	182	822	2	1 072
1989	58	154	696	3	911
1990	40	135	609	7	791
1991	38	125	470	6	639
1992	52	141	472	4	669
1993	43	164	434	3	644
1994	33	172	565	4	774
1995	35	176	615	4	830
1996	47	119	511	2	679
1997	50	112	517	3	682
1998	55	155	494	4	708
1999	50	188	467	8	713
2000	75	174	527	7	783
2001	51	183	470	8	712
2002	120	187	722	5	1 034
2003	64	218	446	5	733
2004	69	213	500	8	790

Frequency	--	-G	B-	GB	Total
2005	59	225	460	6	750
2006	107	271	570	12	960
2007	121	262	646	7	1 036
2008	98	249	739	5	1 091
2009	133	213	660	4	1 010
2010	81	235	684	8	1 008
2011	75	236	622	6	939
2012	69	232	536	6	843
2013	39	210	464	9	722
2014	42	210	541	5	798
2015	39	264	556	5	864
2016	64	621	488	5	1 178
2017	9	141	136	2	288
Total	31 784	13 348	168 651	466	214 249