DIGITAL CITIZENS

DIGITAL NATIONS

the next agenda
INTRODUCING THE CONTEXT

DIGITAL CITIZENS CREATE A DIGITAL NATION
Citizens will play the lead role as they – in the next phase of the information society – collectively create a digital nation. Personal adoption of information and communication technology will create a digital infrastructure that supports individual and collective health, governance and public safety. This new development will require active support from governments and other stakeholders because its requirements are currently not available. In fact, in the next decade, the citizens’ digital environment will be a dominant factor determining the quality of life of nations. And while doing so they, their neighborhoods, towns, regions and society will become increasingly dependent on its use and the quality of the IT infrastructure, and citizens becomes a factor of national importance. This publication identifies that new development and the challenges it poses for the information society. It outlines ‘citizen information management’ as an approach that clarifies the opportunities and challenges and allows governments, suppliers and other stakeholders to create optimal circumstances to support citizens in their effective use of information technology.

NEXT STEP IN THE DEVELOPMENT OF THE INFORMATION SOCIETY
The new role for citizens is the natural next step in the development of the information society. In many countries citizens are increasingly online, using PCs, laptops, tablets, smartphones and other digital platforms. In more and more countries more than 80% of the population is online and regularly uses Internet. There are 40,000 smartphone apps just for health and fitness on both Android and iOS and the coming years such possibilities will only increase.

STRATEGIC IMPORTANCE OF INFORMATION INFRASTRUCTURE
Our own decade long experience in projects and conversations with citizens and professionals from healthcare, government and the safety sector shows that the development of a digital society is rising to a more strategic level. With all members of the population using IT their combined use will determine the quality of life on a national scale. Such an integrated digital society consists of digital citizens in digital households and requires us to rethink technology, data, information, products and services in the personal environment of citizens. It becomes clear that a larger infrastructure is needed to support the continued quality and usefulness of citizens’ use of IT. And that suppliers and organizations will have to pay attention beyond individual solutions catering individual users. This publication proposes ‘citizen information management’ as a way to make the coming challenges and opportunities visible in a way that allows them to be addressed effectively.

eSociety Institute
The Hague University of Applied Sciences
The Hague, May 2015
CITIZEN INFORMATION MANAGEMENT | A PROGRAM

The publication introduces the concept of citizen information management in three ways:

- As a development that shows a clear trend for the coming years
- As a conceptual context that identifies opportunities and challenges
- As a program for the coming years

There are a number of reasons why the increasing digitization of citizens requires attention and why it should be embraced as a program:

- The urgency to support citizens in a society in transit
- Individual citizens are not able to create their own solutions nor the support for those
- Solutions around citizens are not the responsibility of any of the existing stakeholders

Citizens are unable to run information management at levels above their own. Governments carries the responsibility for citizens’ and societies’ quality of life. Information management for citizens starts to become part of that responsibility as a requirement for the societies’ quality of life.

Currently no party in society has responsibility for citizens’ information management. Governments take responsibility for their own information management and organize these in relation to citizens as good as possible. It is like government information management, but for citizens. In this publication we speak about citizen information management that acknowledges the specific qualities and challenges that citizens have today and will develop in the coming years. Never before did we realize that those needs are fundamentally different than those of professionals.
DIGITAL CITIZENS EMBRACING GOVERNANCE
LOCALLY AND AT HOME

Ever since Mary Price came to the town, she is actively involved in the homecare team of the village cooperative. Those living there take responsibility for the towns’ needs in different teams, each with its own coordinator. Teams consist of inhabitants and sometimes outside experts and a city civil servant. Any ideas on what should be happening are contributed, developed and discussed online. Citizens and experts discuss during meetings and online. Only citizens vote. The resulting plans are put in the online community and shared with everybody, where then citizens can coordinate their activities and exchange information to realize them.

In an ‘online cockpit’ the people can see how their town is doing: health, finances, economy, crime and safety, education, and social welfare. The numbers are collected from the inhabitants of the town itself, suppliers, services and the local government are compared to others at local, regional and national level. With this almost real time view on the quality of life of their town they keep tabs on how they are doing.

The safety team put up a sensor network for air quality and traffic noise in and around the town. After some burglaries they also installed a few cameras to check the neighborhood for a while – they are being monitored in the regional police control room. The safety section in the online community platform contains latest regulations and best practices from neighboring towns.

Mary is also a member of the finances team that is responsible for the towns’ finances. Although they have a number of tasks, their budget is a couple of million dollars. They use their own online citizens’ financial system that has a specific structure that is understandable for citizens and at the same time coupled with the existing large financial system of the city council of which they are part. Bills and amounts paid, are administered by village inhabitants, and standardization allows for all these transactions to be reported directly in easy to use overviews. If any new rules or regulations appear on a certain subject, those are automatically and immediately available integrated and presented with the decisions they have effect upon.

To do the best job possible citizens monitor what other towns, neighborhoods and cities do on similar activities. Because all processes and contents are described using the same national standardized dictionary of terms, monitoring all that happens is easy, understandable and automatic.
DIGITAL CITIZENS
DIGITAL CITIZENS MANAGE THEIR HEALTH PERSONALLY AND AT HOME

John is 68 years old and recently suffered from a stroke. Naturally he was shocked and scared and is still trying to cope today. He can’t use his arm and hand as he used to and it’s very hard to get washed and dressed in the morning, something he would really like to be able to do again. Luckily his wife Sonja is able to help him out. Together with his rehabilitation specialist he set up a recovery plan that aims to enable him to wash and get dressed again. He’s very happy he can use a personal digital rehabilitation environment at home. It allows him to do exercises, get reports on progress and he doesn’t have to travel to the rehabilitation center – a two-hour drive each time. For his hand and arm exercises he uses a digital shirt that senses the position of arm and hand and the extent and force of the movements. It makes exercising easier and more fun: the shirt is connected to the TV and his exercises are shown as small games. They’re not only more fun, he is also corrected when the exercises can be done better and he monitors his progress immediately on his smartphone. There are small videos he can use to see how the exercises are done in the best possible way. The smartphone app reminds him when to exercise. He also uses it to track his steps and sleep, keeping track of his overall vitality.

The information is also passed on to his physiotherapist and his rehabilitation specialist. They are stored in the respective Patient Health Record management systems. Both can now monitor whether John does his exercises, and how he progresses. They can even adjust the level and intensity of the exercises at a distance. They’re happy they can see all this at a glance – normally it would have taken an hour or longer to establish this in a face-to-face appointment. In this way it is not only easier, but in fact of higher quality!

On some weekdays, when Sonja goes out to work, one of a group of local volunteers comes to help him getting out of bed, wash and dress. To coordinate their activities they use an online health community system. It allows them to make and keep schedules, organize their payments and exchange small comments on what to do. John, of course, uses a portal for all his dealings with his health insurance company. After his stroke he was left with a poor memory and sometimes forgets to take his medicine. To remember, he uses a small digital medicine box that sends automatic reminders on his smartphone. When he wants he can also add remarks next to each medicine, so that his doctor can keep track of any side effects when they occur.

John is happy and comfortable using his personal digital rehabilitation environment: it helps him do his exercises, organize the rehabilitation at home, and in general makes him feel in control, even though his memory may leave him and he is slightly paralyzed. He already notices progress but also realizes that he is dependent on his digital environment and needs to maintain it carefully.
DIGITAL CITIZENS IN DIGITAL NETWORKS

Citizens will increasingly support the day-to-day life of their families and homes by an integrated infrastructure that consists of technology, data, products and services.

STAYING HEALTHY - DIGITALLY
Digital citizens will support their health digitally: they monitor their quality of life and vital health readings, get digital feedback, advice and diagnosis, determine their needs for care, organize their healthcare and welfare processes with their social network and volunteers, determine the quality and efficiency of their care process and handle finances. The amount of health data patients collect at home is larger than that of the professionals that treat them. This personal data will be enriched by publicly available data on the quality of health and illness at the neighborhood, city, regional and national level. Digital knowledge on health and illness is freely available and covers symptoms, illnesses, possible treatments, prognoses, side effects of medication and activities that may strengthen health. From their personal digital environment they communicate with the different professionals that treat them. In order to facilitate these activities citizens may use a wide variety of applications, products and services that may be personalized to their needs.

LIVING TOGETHER – DIGITALLY
Citizens use digital means to take responsibility for the safety and quality of life in their environment. They may make reports digitally, develop ideas together digitally how to best deal with situations, decide using digital systems and organize the activities involved in maintaining quality and safety in their neighborhood or town. Their digital community systems are connected to all other stakeholders that might be involved in safety and quality of life – they may inform or alarm others to take action. Citizens in neighborhoods, towns, cities and regions have access to actual and recent data about safety and quality of life of their environment, integrated, analyzed and presented in an understandable way. Their own systems – such as cameras for surveillance – may, when needed, be integrated in networks of professional organizations.
DIGITAL CONVERGENCE AS A RISK

But the on-going adoption of digital solutions will result in the convergence of digital products and services for the household. Citizens will feel increasingly dependent on such a diversity of digital solutions as governments and professionals will slowly migrate to digital solutions.

When patients with a chronic illness will have to use five different digital products to monitor vital signs (glucose, insulin, step counter, blood pressure and weight) and several portals to communicate with the professionals that treat them (general practitioner, specialist, hospital, homecare team and their own social network) they may lose overview. Not being able to integrate information, data and appointments becomes unworkable and creates risk. At this moment there are only a few, if any, larger efforts to integrate this complexity.

This complexity may lead to confusion and a burden on users. As health problems increase with age, many users will be older and may be challenged in their ability to understand and their level of skill.
DIGITAL SOCIETIES

Digital citizens live and work supported by their own digital networks in six domains of life. They are empowered by an increasing number of digital solutions: online communities, online decision-making, home automation, health portals, e-health solutions on thousands of different smartphone apps that track vital signs like blood pressure, heart rate, glucose, general activity, food intake and sleeping patterns.

While often citizens are looked upon as ‘individuals’, people live and work together with others in social networks that are flexible and adaptive. They keep health in networks, have fun in networks and develop themselves in networks. Citizens supporting those networks with digital solutions will turn societies into a connected, integrated and interoperable digital infrastructure for and by citizens. Together they create a ‘digital nation’ with their digital infrastructure as an essential ingredient to uphold quality of life. The creation of the right conditions for this development requires a vision on what will happen, and awareness and motivation of what needs to be done and how to do it.

Cities will need to support the digital life of their citizens. Not only do they need to build up the necessary infrastructure, but to meaningfully participate they need information that support the quality of life of their citizens and allows them to know what to do, why to do it, how to do it and when to do it. They need to communicate with each other and coordinate activities at the level of their neighborhood, city and region. Organizing and providing such information requires an integrated information infrastructure in domains that govern quality of life, such as public health, public safety and security and public governance. To conceptualize and organize such an infrastructure requires an integrated approach.
WHY DIGITAL CITIZENS ARE DIFFERENT

The use of IT by citizens in their daily life is fundamentally different from that of professionals: that creates very specific requirements for a digital society. The structural use of digital solutions by citizens means the shift from the ‘systems world’ of professionals to the ‘life world’ of people in their day-to-day lives and environment.

That citizens will become a dominant factor in the next phase of the information society is the expected next step in its development. Technology has become personal, prices have come down, communication is effortless which results in the development of integrated information infrastructures now centered around the citizen. This may sound self-evident but it is a new development without prior history. We actually have very little notion of the specific requirements that citizens have in their personal lives, even though we have spent years optimizing the usability of individual applications. But that is no longer sufficient and we need direct our attention to the broader infrastructure supporting a digital nation, where people digitally coordinate their lives, work and activities together in smaller and larger groups. This development is characterized by three new challenges that set it apart from professional information infrastructures.

QUALITY – PEOPLE SPEAK THEIR OWN LANGUAGE

In our own lives we speak our own language. We may suffer from a stroke but not call it CVA (‘Cerebro Vascular Accident’) or TIA (‘Transient Ischaemic Attack’). We talk about money and not ‘liquidity’. People use their own language, where professionals need more precise terminology to do their work. For digital solutions to work for citizens, they need to speak the language of people. For health providers in a country that will mean they – in order to communicate consistently and interoperable with consumers – should use a standardized consumer health vocabulary, such as the one that was developed in the US some years ago.

Next to speaking their own language, people understand things in their own way. The distribution of IQ (Intelligence Quotient) throughout societies is such that half the people have an IQ lower than 100. They will understand the world more in concrete and simple terms instead of abstract and complex. This requires designers to adjust their design for different limitations, whether it is physical, cognitive, emotional or social.

<table>
<thead>
<tr>
<th>Citizens’ life-world</th>
<th>Professionals’ systems-world</th>
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<tbody>
<tr>
<td>Emotional closeness</td>
<td>Professional distance</td>
</tr>
<tr>
<td>Informal action</td>
<td>Formal protocols</td>
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<tr>
<td>Incidental interest</td>
<td>Structural attention</td>
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<tr>
<td>Informal social network</td>
<td>Formal professional network</td>
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<tr>
<td>Mixed levels of understanding</td>
<td>Professional understanding</td>
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<tr>
<td>Flexible work</td>
<td>Fixed, planned work</td>
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<td>Integrated tasks</td>
<td>Specialized tasks</td>
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<tr>
<td>Day-to-day language</td>
<td>Professional jargon</td>
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<tr>
<td>Practical skills</td>
<td>Professional knowledge</td>
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<tr>
<td>Informal appointments</td>
<td>Formal appointments</td>
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People do things for their own reasons as everyday decision-making isn’t pretty, formal or explicit. In order for digital solutions to support citizens they should be aware of this to support people in decision-making on their own terms. Designers of digital solutions for the society need to design for inspiration more than ‘nudging’. These specific qualities of citizens in their personal environment are essential when the combined use of digital solutions by citizens, patients, clients and customers becomes an essential factor upholding the quality of life in society in nations.

**COMPLEXITY – DIVERSITY REQUIRES INTEGRATION**

The growing diversity of digital solutions in the household creates technical challenges, data inconsistencies and information overload. Products and services may be designed to work effectively for a single user, but often not to interoperate with the products and services of other providers. Healthcare apps generally don’t integrate their data with other apps. Government services provide individual services, often not integrated or providing a comprehensive overview of all interactions with government.

But citizens work and live in networks with many partners and integrating all health information would make things more understandable and less prone to mistakes. To facilitate user-friendly home digital environments integration is necessary at the technological, data, information and presentation levels. Such integration is not available now and it is not in the interest of individual suppliers and providers.

**SCALE**

People live and grow in groups and networks. That is why citizens need to be supported and empowered at a different scale than the individual. Digital solutions need to be effective at the level of groups, neighborhoods, towns, cities, regions and society. Their data need to be interchangeable and consistent and their services scalable and understandable at every level.

Some countries aim to activate citizens to participate more fully. But how can they participate if not even the different steps in the processes of government, healthcare and safety and security are standardized and digitally available? How do they know what to call the different steps and stages and how to check progress? To be able to live in a participative society citizens need information at the level of processes as well as their content.

<table>
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<tr>
<th>Life world citizens</th>
<th>Systems world professionals</th>
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<tr>
<td><strong>Macro</strong></td>
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<td>city and society</td>
<td>sector, government and society</td>
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<td><strong>Meso</strong></td>
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<tr>
<td>groups, neighborhoods, towns</td>
<td>organizations</td>
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<tr>
<td><strong>Micro</strong></td>
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<tr>
<td>citizen</td>
<td>professional</td>
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THE NEXT AGENDA
CITIZEN INFORMATION MANAGEMENT
‘DIGITAL CITIZENS | DIGITAL NATIONS’ REFERS TO THE INTEGRATED INFORMATION INFRASTRUCTURE USED BY CITIZENS TO STIMULATE THEIR INDIVIDUAL AND COLLECTIVE QUALITY OF LIFE
CITIZEN INFORMATION MANAGEMENT

INFORMATION POLICY FOR CITIZENS

Digital citizens will extend their digital activities to participate in the society to include health, government and safety which will then lead to:

- Structural coordination and execution of tasks in health, welfare, safety and public governance
- Getting and using advice to support decision-making, besides the simple consumption of information
- Structural digital cooperation with a diversity of partners in networks

The quality of that digital infrastructure plays such an essential role in the quality of life by individual citizens and groups, neighborhoods, cities and regions that this ‘integrated information infrastructure’ is of national importance. In this context the view ‘digital citizens | digital nations’ is an integral approach that states:

- The integrated information infrastructure used by citizens is essential to the quality of life in nations
- The integrated information infrastructure of citizens is so interconnected with that of professionals that they may be seen as a single digital infrastructure: a digital society as a dense web of digital services and products
- Organizing that infrastructure is necessary to guarantee effectiveness and efficiency

The current attention of governments and developers for the large scale use of ICT by citizens is insufficient and happens mainly in the context of professional services or solutions for individual users.
THE VALUE OF AN INTEGRAL VISION

CITIZENS’ NEEDS VISIBLE
Citizen information management shifts the focus to the citizen as the originator and coordinator of a personal digital infrastructure in which professionals may participate if called for.

URGENCY
Many countries look to increase quality and efficiency and reduce cost in professional services. Citizens’ participation is essential and with that their digital infrastructure. Many of these transitions will need to take place during the next decade or two, which requires that we create a working, efficient and effective nation wide digital infrastructure for citizens within that timeframe. Citizen information management as an activity should aim to make clear what that means, what needs to be done and how it can be done.

THE QUALITY OF CITIZENS
Citizen information management is able to identify the specific needs of citizens in their use of information technology and identifies directions for answering those. Case in point is the development of consumer vocabularies to create consistency communication in different domains.

COLLECTIVE NEEDS AND SOLUTIONS
Citizen information management identifies the added value of collaborative solutions. A shared view on opportunities and challenges may create an ‘alliance of the willing’. High quality in working solutions might be stimulated by making standards available as well as code libraries or best practices that may be used by developers.

INTERDISCIPLINARY AND INTER SECTORIAL
Citizens needs are the same for different domains, but solutions are created within domains and not shared. Processes for services in the healthcare sector may be similar to these in government and public safety and citizens might benefit from a single interface able to handle them all. There is too little attention for this and collaboration at this level is a challenge. Citizen information management makes this clear and opens the possibility for better solutions.

NATIONAL INFRASTRUCTURE
Citizen information management makes it possible to conceptualize a national information infrastructure that supports citizens and their needs. This is different from professional organizations addressing the needs of their customers, where citizens are participants in professionals’ structures and processes.
DIGITAL OPPORTUNITIES – NEW TECHNOLOGIES
ESSENTIAL

Our own use of digital solutions and Internet has become somewhat predictable: products keep getting smaller and more powerful; one can buy more for less and the number of social and collaborative applications increases. But the coming years will be different as new digital developments will become more visible: the smart world, smart data and the smart web.

In the **smart world** ‘things’ become smart and connect to what is commonly known as the ‘internet of things’. It means that water cookers, cars, dustbins, traffic lights, parking spaces will be able to share their information and inform us better. Used to monitor activities in personal lives this results in the ‘quantified self’ that allows the monitoring of health and daily life on a large scale. The ‘internet of things’ creates the ability to feel the pulse of life in real time and get better advise on maintain quality.

**Smart data** develops now that the amount of data increases – the different estimates for 2020 range from 20 times to 40 times as much data as in 2015. Not all data is created by individual people or administrative systems. New kinds of ‘big data’ are the results of the products and services we use, such as social media, mobile phones, road sensors, car sensors or healthcare sensors. ‘Big data’ technologies allow us to store, analyze and present such data in different ways. It brings scale to information management for quality of life.

The **smart web** will be about connecting knowledge, where the current web is about connecting people. This ‘semantic web’ or web 3.0 is especially interesting for digital societies because it will allow us to digitally connect and share knowledge, empowering citizens to act and participate.

These new developments play an essential central role in facilitating digital citizens taking their place in a participative society.
CITIZEN INFORMATION MANAGEMENT

‘Citizen information management’ would have to be capable of comprehensively describing the qualities, components and processes that support an architecture. To indicate possible aspects involved here are some examples:

CITIZEN DIGITAL TECHNOLOGY
Is the quality of consumer technology sufficient for the usage that we see developing in the coming years? Are current standards enough to create an integrated environment for users at home on the technology, data and services level? Are there specific requirements for digital citizens on critical infrastructure?

CITIZEN DATA
What data do we deem essential to maintain quality of life and to be shared by citizens? What data should be available on public health? What data on public safety? Who creates, owns and processes this data?

CITIZEN DATA INFRASTRUCTURE
What is the optimal management of data that allows creating, store, maintaining, enriching and presenting data to citizens? What linked open data definitions for health, governance and public safety are necessary? What calculations for public health issues do we use and how do we define and maintain those?

CITIZEN INFORMATION SERVICES
What services are necessary to provide citizens with the right data, information and solutions to live in a digital society? What information services inform neighborhoods, towns, cities and regions?

REGULATORY FRAMEWORK FOR CITIZEN INFORMATION
Do citizens have the right to use certain information? Do they have the right for privacy? Do they own their own data and information?
**THE ROLE OF GOVERNMENT AND OTHER STAKEHOLDERS**

In the coming years governments and other stakeholders will start to play a role in better organizing information around citizens, whether it is their own information or information from others. Together they will formulate the context of citizens’ use of information, develop standards, stimulate good practices and be a launching customer for some initial products.

| **GOVERNMENT** | Create awareness of opportunities and challenges  
Develop and share a clear agenda for development  
Create policy for stimulation and adoption of new practices and standards  
Be launching customer for some services |
| **KNOWLEDGE INSTITUTIONS** | Research the needs and wants of citizens  
Develop standards  
Develop good practices  
Benchmark quality of information use for citizens |
| **DEVELOPERS** | Become aware of needs and opportunities  
Embrace good practices  
Develop tools for better development  
Integrate better quality standards in products |
| **PROVIDERS AND SUPPLIERS** | Become aware of the opportunities and challenges  
Offer services helping citizens to better manage their informative technology  
Offer and maintain better quality products |
| **CITIZENS** | Become aware of opportunities and challenges  
Educate themselves  
Buy, install and maintain the digital solutions responsibly |
A CITIZENS’ DIGITAL SOCIETY

digital citizens will together create a digital nation
they are the central players
in the next phase in the information society

large scale use of ICT by citizen to support their quality of life
creates its own requirements
identify the opportunities and challenges
of these developments

create a practical agenda
for design, development and deployment
that will facilitate the use of digital solutions by citizens

identify the players
that may or will have to play a role
in the development of digital citizens
AN OPEN DATA SOCIETY

The interest for open data is increasing in many countries worldwide. Although more and more data sets become available, development seems to slow sometimes as large scale up takings prove themselves to be challenging. This scenario describes a fully developed ‘open data society’ and from these the agenda for its development.

In an open data society data that are of importance to quality of life are freely available for everyone (‘open data’) and easily digitally accessible (‘linked data’). The generally identified value of open data is

- Greater transparency of government
- Efficiency in work by re-use of information
- Empowering citizens to participate and take responsibility

An open data society has two elements:

- The free availability of open data collections
- The ability to answer questions

In an open data society citizens can pose questions to the internet on health, safety and security, government and governance and get an answer, as easy as a navigation system provides directions.

THE CITY IN A 1000 QUESTIONS

Being able to do so, would create ‘a city in a 1000 questions’. It would answer citizens’ questions like: is there any risk for flu in this neighborhood? Is this street safe? Are there any active policy initiatives for this neighborhood?
ANATOMY OF AN OPEN DATA SOCIETY
To answer such a question easily, automatically and fully digitally it is required that
■ The right data are available
■ Concepts used, standardized and machine readable
■ Definitions and analyses are defined in machine readable form and available
■ Necessary calculations are defined in machine readable form and available
■ Calculations are done automatically
■ Results can be presented in the right form and right time

The interconnectedness of all these elements should create a ‘seamless experience’ for users. Currently large services that provide these qualities are not available. But they are normal components of the semantic web (also web 3.0). Fulfilling any of the elements of the open data society requires investment in design, development and deployment.

OPEN DATA SOCIETY AS PART OF CITIZEN INFORMATION MANAGEMENT
The scale and possible importance of an ‘open data society’ for citizens and their individual and collective quality of life means that a coordinated effort should be undertaken for its development.
INTEGRATED DIGITAL ENVIRONMENT

HEALTH

When citizens start using information technology as producers of data, a number of new challenges appear:

When using a multiplicity of digital products and services the resulting complexity becomes a risk when citizens depend on ICT. There is a need to integrate different digital applications and their data in a way that improves usability for citizens – combining data from different appliances and presenting in a single, coherent way.

When professionals, such as those in health, have 2000+ patients which all use different appliances to measure their heart rate and cardiogram they also have the need for integration of the data into their systems, just as their patients at home.

When hospitals and organizations, supporting thousands of patients, are confronted with their data and digital video communication, they in turn need to prepare their infrastructures and architectures to be able to accommodate the data and information.
That is an example of how, when citizens become digitally active, new requirements arise that will have to be met to enable citizens and all other parties to benefit from digital solutions.

The illustration below shows a patient that suffered from a stroke and, while at home, uses one or more physical appliances to monitor and train his physical abilities. The measurements are then shared with the patient himself, the professionals that treat him and the organizations that support them. Each of these needs to integrate the data into his or her systems to effectively use them.
THE DUTCH CONTEXT

The thinking on citizen information management in this publication originated in The Netherlands and is a consequence of the development of the information society there.

A DIGITAL SOCIETY
Close to 100% of the population is connected to the Internet and more than 50% of those have access to broadband with speeds that are the highest in European benchmark studies. All people up to 75 years of age use the Internet regularly, mostly daily. Adoption of technology is pervasive as last year they had the most users of Twitter and LinkedIn, the most webshops and the most online therapies per capita worldwide.

THE CHALLENGE FOR PARTICIPATION
At the same time the Dutch society is confronted with the transformation of the healthcare and welfare sectors, and moving towards a participative society where citizens need to take care of themselves more than they have been used to. That transformation is partly due to financial reasons, but partly the consequence of demographics with the effects of an aging society (larger percentage of older people) with a smaller percentage of younger people. Ministries predict that those compounded developments will cause a 40% reduction of employees in government by 2022. Those numbers are true for sectors that are seen as relatively unattractive to work in. Although the studies did not look at healthcare, one might assume the number might be comparable.

Those two facts create the sense of urgency and the structural attention for citizen information management and the scenarios described in this publication.
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Government of the future is a program that looks at e-democracy, transparent government en open data. They train civil servants at the city and regional level, support social media and open data projects.

Future Care looks at the use of apps in health situations, aids organizations in creating strategies and practices around the adoption of apps in health and welfare. The institute has extensive experience with the use of ICT to increase quality of life in poor neighborhoods and how citizens adopt technology in their daily life.