Strategy for a National Digital Society

Integral approach equipping digital citizens

Bert Mulder
eSociety Institute
The Hague University of Applied Sciences
The Hague, The Netherlands
a.w.mulder@hhs.nl

Martijn Hartog
eSociety Institute
The Hague University of Applied Sciences
The Hague, The Netherlands
m.w.hartog@hhs.nl

***Abstract*– In The Netherlands, an increasing number of projects give experimental form to structural participation of citizens in the design and implementation of local governance and social programs at the local level. The focus on a compact government and diminishing numbers of employees in healthcare and welfare create a participatory society in which citizens become increasingly dependent on digital services. But as of yet, there is no widespread adoption and broad I(C)T infrastructural support equipping digital citizens in their participatory efforts. The participatory society requires citizens to make decisions, coordinate activities and perform tasks benefitting individual and social quality of life. This idea outlines a conceptual design approach identifying and researching a national information architecture and infrastructure supporting and equipping digital citizens in the participatory society of The Netherlands.**

Keywords-participatory society; digital citizens; architecture; infrastructures; digitization.

I. INTRODUCTION

The Dutch national government acknowledges the general challenges and capacities citizens face in an information society. They recognize the importance of digital information on which citizens depend maintaining the quality of life, individually and collectively as a society. But they still ignore the possible benefits of a consistent information architecture that fits the citizens' new participatory role.

When many citizens become more active and equal partners of governmental organizations, they influence and change the dynamics, role and responsibilities of stakeholders in the policy process. Supporting such developments on a national scale requires a new approach to information quality and its ability to answer the requirements of such new policy processes. It poses a new challenge for the Dutch government.

The large-scale use of IT by citizens for health, welfare, safety and governance underpins the quality of life on a national scale [1][2]. Ongoing structural adoption creates an integrated digital society that consists of digital citizens in digital households and requires us to rethink technology, data, information, products and services as seen from the personal environment of citizens.

II. DIGITAL CITIZENS

Increasing adoption and intensifying use of ICT by citizens will result in a convergence of digital services on their households (Figure 1).

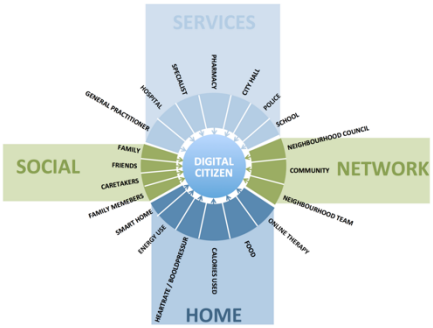

Figure 1. Convergence of services on the individual household.

Citizens that organize their health, governance and public safety individually do so collaborating with other individuals and organizations. Intensifying such collaborative use that binds together different stakeholders by exchanging data and information creates a cohesive digital infrastructure. This development shows that the development of a digital society is entering a new phase that, beyond individual applications, depends on the quality of an ecology of infrastructures, data and services supported by the right regulation, financial retribution and market dynamics. Where these services are a basic requirement for quality of life in society (such as health, governance, education and safety) they will require active support from governments and other stakeholders because its requirements are currently not available.

Citizens will become increasingly dependent on use and quality of the IT infrastructure in their neighborhoods, towns, regions and society. This development will focus attention on citizens as a key driver in the creation of a digital society and with that they become a factor of national importance [3].

A. 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

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processes with their social network and volunteers, determine the quality and efficiency of their care process and handle finances. The amount of health data individual patients collect in their home environment is larger than the data that professionals have about 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. From their personal digital environment, they communicate with the different professionals that treat them. To facilitate these activities citizens, use a wide variety of applications, products and services that may be personalized to their needs.

The Dutch Patients and Consumers Federation (NPCF) [4] and the Dutch Council for Health and Care [5] propose, in two different reports, that patients will get their own storage for health-related data. Professional organizations such as hospitals, general practitioners and pharmacies already have their own administrative systems (EPDs or Electronic Patient Data).

This development departs from professional organizations organizing information for their professionals where citizens are participants in professionals' structures and processes. Now the digital infrastructure around patients themselves develops a complexity that requires its own structured storage. It is the first proposal that acknowledges that citizens digitally 'grow up' and proposes they the informal 'life world' of citizens be digitally integrated in the formal 'systems world' of professionals.

B. Living together – digitally

Citizens use digital means to take responsibility for the safety and quality of life in their environment [6]. Today they use Whatsapp groups to share neighborhood observations or develop ideas together in communities supporting the collection, development and planning of collective ambition. Other cities of neighborhoods use participatory budgeting to collective develop ideas and their execution. Such digital community systems increasingly connect different stakeholders that may be involved in safety and quality of life – and inform or alarm others to act.

In the coming years, such solutions will develop further. Citizens in neighborhoods, towns, cities and regions will 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 personal systems – such as cameras for surveillance – may, when needed, be integrated in networks of professional organizations.

When such services are used structurally and strategically cities will need to support the digital life of their citizens. Not only do they need to build up the necessary infrastructure, but also provide the essential information that support the quality of life of their citizens and enables them to know what to do, why to do it, how to do it and when to do it. They need to facilitate the communication between individual citizens 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 – a strategy for a digital society at the national level.

III. INTEGRAL AND MUTLIDISCIPLINAIRY

Citizens are uninterested in organizing information management at levels above their own. It is also not their responsibility. It is governments that carry the responsibility for citizens' and societies' quality of life. In line with the development described above 'information management for citizens' will become a requirement for the societies' quality of life.

Currently no party in society has responsibility for citizens' information management. Healthcare organizations take care of their own data, as do suppliers, insurance companies, the police and insurance companies. Currently governments take responsibility for their own information management. In the coming years, they will become increasingly interested in the quality of the information infrastructure of and for citizens. It is in this vain that we address the concept of 'citizen information management'.

It is information management that acknowledges the specific qualities and challenges that citizens in their own informal and personal lifeworld encounter today and will develop in the coming years. Citizens are 'professionals at being citizens': they use their own language, think and argument in their own way, do things for their own reasons. Those needs are fundamentally different than those of professionals and require their own angle at information managements [7].

Further developing this concept we propose a coherent digital society information architecture - infrastructure, technology, (open) data, services and users. Developing this at a national scale creates three challenges: a new quality, a new scale and a new complexity of an infrastructure shared by all citizens of The Netherlands.

- The new challenge on quality is that of the personal environment of citizens: informal and not professional, emotional and not formal, incidental and not structural, all with an own quality of understanding and reasoning.
- The new challenge on scale is the challenge to create a consistent environment across networks on the different levels of the individual, the household, groups, neighborhoods, cities, regions and countries.
- The new challenge on complexity is organization the exploding diversity of digital services for all

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different stakeholders, such as individual patients, their medical professionals and the healthcare organizations they work with.

Together these challenges create a wicked problem: none of the current stakeholders is able to solve them or is responsible for that. All current players create solutions optimizing their own activities. To enable interoperability previously 'the market' would slowly develop the standards necessary for interoperability or usability, such as the IP standards for internet traffic, the standards for smart home infrastructures or the standards for communication in the healthcare sector. It is a feeble process, often taking decades to develop working standards and sometimes overdeveloping them to the point if becoming unproductive. However, because quality of life in society is a responsibility of the government they may be seen as a stakeholder that might play the role of a catalyst.

IV. DISCUSSION

With the ongoing development of e-health, e-government and e-democracy and the increasing broad and structural adoption of the Internet we foresee that the use of digital tools will result in a coherent layer of digital solutions and services at the national level that support citizens and their collaboration among themselves and with professionals. Citizens' strategic and structural use of ICT will be driving the development of uniform national information architecture. That will consist of a consistent and cohesive ecology of infrastructures, data, services, users, regulation and financing and will have the specific requirements of digital citizens and their households as its vantage point [8][9]. The new and different character of this national infrastructure stems from the challenges on the quality, complexity and scale of an information environment centered on citizens.

One of the first domains this development shows is healthcare. Given the current restructuring of the healthcare and welfare in The Netherlands, the national government is urged to assess the value of an integral vision on the necessity, opportunities and challenges of a more comprehensive national architecture for a digital society. Describing developments in terms of a national infrastructure not only makes it possible see new challenges, but also to identify new markets and services and create inspiration for developers and organizations.

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