Digital Competency Models in Scandinavian Public Institutions

Research on the implementation and deployment of digital competency models in Scandinavian Public Institutions

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Research on the implementation and deployment of digital competency models in Scandinavia

Main report

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1 Introduction

In today's rapidly evolving digital landscape, digital competency is no longer a luxury, but a critical necessity for effective public service delivery. From improving citizen engagement to streamlining internal processes, digital skills are essential for navigating the complexities of the modern world. This is true for both managers and employees alike. However, acquiring and implementing a comprehensive digital competency strategy can be challenging.

The UN lists "competence" as one of their 11 principles of effective governance for sustainable development[1], where noted strategies are the promotion of a professional and digitally competent public sector workforce, digital leadership development and training of civil servants to facilitate the acquisition of digital skill sets.

It's easy to get caught up in the allure of technological solutions and overlook the human element of digital transformation. Successful implementation requires a deep understanding of the needs and capabilities of public servants, fostering a culture of continuous learning and adaptation.

In 2024 the Institute of Administrative Information Systems released the report "Developing

Public Sector Digital Competency"[2] which examined what digital competencies in the public sector consist of and how they relate to digital transformation in governments around the world. The present research is a different study, which delves into the experiences of public sector organizations in Denmark and Norway – both global e-government front-runners according to the UN E-Government Survey 2024 (Denmark #1, Norway #15) – to identify effective tools, best practices, and innovative approaches to enhance digital skills within the public service.

By understanding the challenges, embracing a human-centered approach, and learning from leading examples, we can equip our public servants with the digital skills they need to serve citizens effectively in the 21st century.

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[1] https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2024
[2] https://www.iais.or.jp/reports/labreport/20240618/digitalcompetency/

2 Research Overview

2.1 The aim of this research

The aim of this research is to examine how digital competency in the public sector in Denmark and Norway is defined through frameworks and models. Furthermore, we use this insight to show where digital competency fits in human resource development, and what activities are undertaken to develop these continually.

The hypothesis behind this research is that a systematic focus on digital competencies in nations like Denmark and Norway, contribute to their status as digitally advanced societies. Furthermore, the authors hypothesize that such systematic focus entails a broad operationalization of digital competency frameworks, as well as concrete activities to increase digital competencies in the public sector.

2.2 Research Methodology

The research conducted for this report centered on 10 interviews with stakeholders in Denmark and Norway, because of these two countries' high ranking in the UN e-government survey, and because of their geographic and cultural proximity. The geographic and cultural proximity enables a better foundation for comparison, as the attitudes and political systems are very similar. The interviews were conducted online, except for 3 which were carried out by the research team on a study trip to Denmark.

Interviewees were chosen for their experience, role and perspective, so the research could shed a bright and diverse light on the topic of the development of digital competency models in the public sector and development activities for managers and employees.

Table 1: List of interviewees

#	Name	Organization	Role	Country
1	Mr. Christian Nyholm	HK (Danish White Collar Union)	Educational Policy Advisor	Denmark
2	Mr. Anders Schiøler (Digital), Ms. Vivi Rydahl Hansen (HR), Ms. Julie Falholt (HR)	Glostrup Municipality	Digital and HR	Denmark
3	Ms. Jette Skriver	Haderslev Municipality	Project Manager	Denmark
4	Ms. Lonnie Jørgensen	Holbæk Municipality	Project Manager	Denmark

#	Name	Organization	Role	Country
5	Mr. Jesper Hosbond Jensen	Komponent (Development Unit of the Association of Danish Municipalities)	Head Consultant	Denmark
6	Mr. Jacob Brøndum	MapUs Co. Ltd.	CEO	Denmark
7	Ms. Annemarie Holsbro	Technological Institute	Head of Unit, Analysis and Business Promotion	Denmark
8	Mr. Jens Nørve Ms. Jila Ahmadnajad	Norwegian Digital Agency	Head of Department and Digital Consultant	Norway
9	Ms. Pernille Kræmmergaard	DI2X Co. Ltd.	CEO	Denmark
10	Ms. Ann-Helen Moum	Kristiansand Municipality	Head of Digital	Norway

2.3 The structure of this report

To support the stated aim of the research, the report is structured in the following way.

The first section provides an overview of the importance of digital competencies and examines what kind of understanding is behind the systematic focus on digital competencies.

The second section highlights frameworks and models of digital competencies, to showcase how digital competencies are presented and delineated. A framework is a delineation of an area of knowledge, while models cover part or all of a framework in order to operationalize it and help people use the knowledge in the frameworks for their jobs. Furthermore, the section investigates and compares how models are made.

The third section is concerned with how models are used through tools and practices, and it aims to present ways of acquiring digital competencies.

The conclusion summarizes the main findings of the report.

3 Components, acquisition and challenges of Digital Competencies

3.1 What are digital competencies?

3.1.1 A Working definition of Digital Competencies

"Competence" and "competency" are two terms used to describe the knowledge, skills, and mindset (behavioral characteristics and attitudes) that people and organizations possess. Although these are often treated as synonyms, there are cases where they are used differently as follows. .

In general, "digital competence" refers to the knowledge, skills, and mindset that individuals and organizations currently possess to utilize digital technology. In contrast, "digital competency" can refer to the totality of abilities, including the mindset that successful people and organizations share, and can also be positioned as an ideal image that should be possessed in the future (Figure 1).
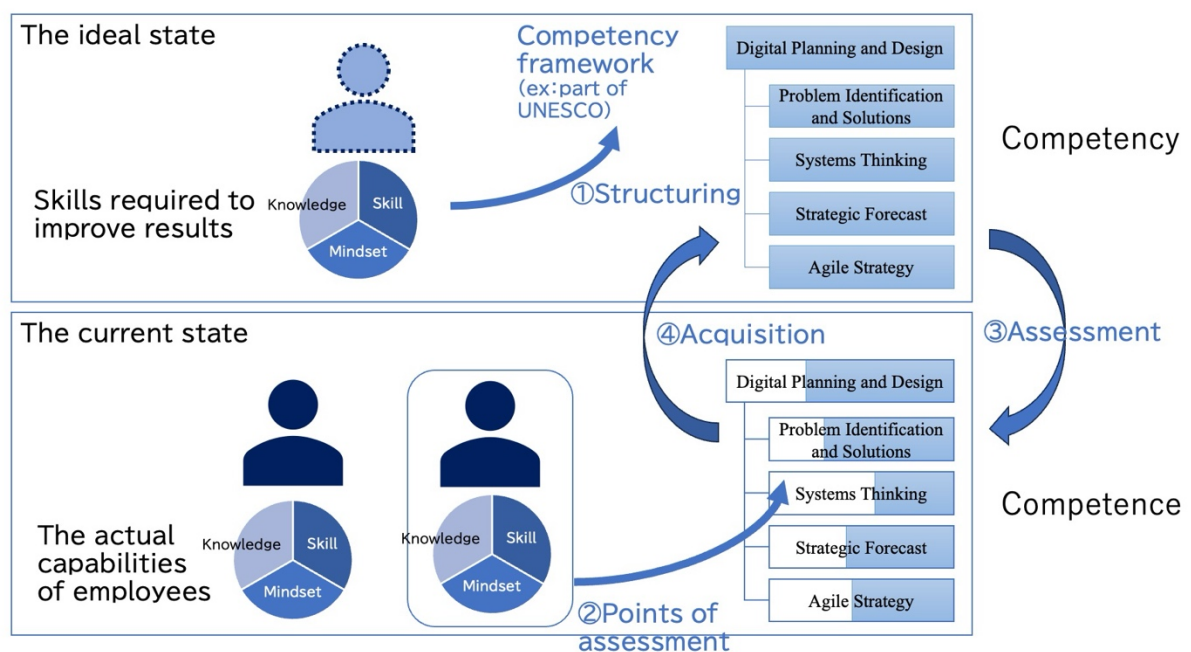
Figure 1: The relationship between competence and competency (by Eiji Kano)

The terms "digital competency" and "digital competence" are used differently depending on the country, organization, and context, and there is no uniform definition. In this report, we use the term "digital competency," excluding proper nouns such as specific document names, in order to provide knowledge to organizations that are trying to build a system of knowledge, skills, and mindsets that will be newly required of individuals and organizations in the future.

A similar term is digital literacy.

"Literacy" is defined as "the ability to understand and carry out something at a basic level."

On the other hand, "competency" refers to "the ability to carry out specific tasks, acquired through training." It is also sometimes used as a synonym for "professional specialized skills." (Figure 1) [3,4]

Digital Competency	
Digital Literacy	Attitude
Knowledge	
"Hard" skills	"Soft" skills
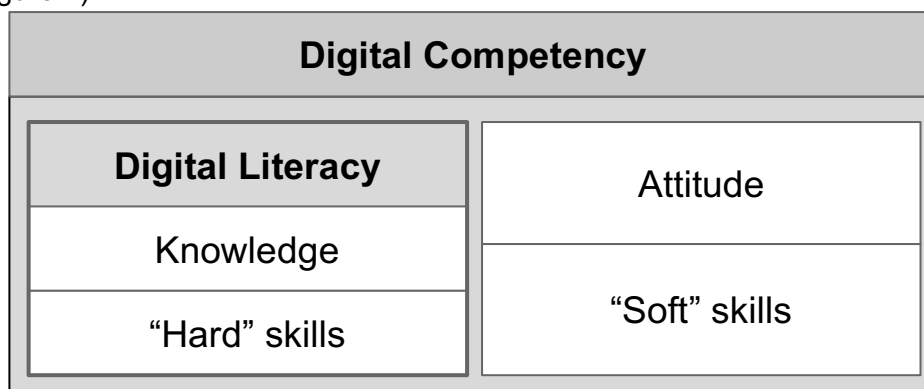
Figure 2: Elements of Digital Competency

The Digital Competence Framework for Citizens (DigComp) 2.2 from the European Commission is intentionally broad in its application, as it aims to speak to the entire citizenry. We will examine the content of this framework later, but we quote it here to give a sense of the subject matter.

"Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking."[5]

3.1.2 Individual and Team Perspective

In this report, we discuss digital competencies from both the individual and team (organizational) perspectives. In other words, while we focus on improving individual digital competencies, we do not assume that an individual possesses all competencies. Rather, we take the position that it is important to view the competencies necessary to promote DX as abilities that should be appropriately shared and allocated across a team or organization. This point is discussed in detail in the 2024 AIS report on digital competencies.[6]

3.1.3 Hierarchy of Application of Digital Competencies

In order to simplify the context of digital competency in general, the Danish former professor and current entrepreneur Pernille Kræmmegaard offers three general categories:

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[3] https://www.indeed.com/career-advice/career-development/competence-vs-competency
[4] https://files.eric.ed.gov/fulltext/EJ1312102.pdf
[5] https://publications.jrc.ec.europa.eu/repository/handle/JRC128415
[6] https://www.iais.or.jp/en/contents/developing-public-sector-digital-competency/

1. **Competency of use**
   Management needs to be able to create concepts for onboarding for example, and give employees competency of use. Competency of use is what is most generally understood by the word digital competence - whether or not people are capable of putting digital tools to their best use.

2. **Competency of creation**
   Creation is about curiosity and trying things out. With competence of creation, employees and managers alike are equipped to be asking more critical questions of business as usual. Which is a key step towards digital transformation.

3. **Competency of concept**
   Like McDonald's onboard their employees to bring them up to speed as fast as possible, the municipality should do more to give people a sense of collaboration, flows of work and data - the foundational concept of the organization. Municipalities should make the employees well acquainted with processes, so they can exercise critical thinking better.

These three categories denote a hierarchy of the application of digital competency. Namely, there is a progression from simply being able to use the tools at hand, to actually create something and finally to conceptualize the possibilities of new technology within the existing context.

3.1.4 Facets of Digital Competencies

The European Union's Digital Competence Framework for Citizens (DigComp 2.2) is a framework that covers "knowledge, skills and attitudes that help citizens engage confidently, critically and safely with digital technologies". Knowledge, skill and attitude are thus denoting complementary facets of competence:4

1. **Knowledge**
   Knowledge is the result of assimilated information acquired through learning. Knowledge is a bank of stored facts, theories, principles, and traditions related to a work or study. Knowledge can best be described as theoretical or factual.

2. **Skill**
   A skill is the ability to solve a task or problem in practice, while an instrumental skill is the ability to use a method, material or tool.

3. **Attitude**
   Attitudes and mindsets represent ways of thinking and motivations for action. Therefore, they have a major influence on people's digital activities. This includes, for example, ethics, values, priorities, responsibility, collaboration and autonomy.

These facets are all existing to some degree in everyone. But we can train them specifically, when we are aware of them.

Likewise the OECD "Developing Skills for Digital Government"[7] report defines the content of competence frameworks in the following manner:

"Competence frameworks describe and synthesise the knowledge, skills and attitudes required by civil servants involved in the digital transformation of government and the delivery of digital services."

A further distinction is between what competence frameworks can cover: from technical skills, to more socio-emotional skills. The OECD report continues their definition like this:

*"The focus of competence frameworks can either be core digital skills and knowledge, technical digital skills, or the specific competencies required in a digital-era government (see Table 2.1). Frameworks focusing on core digital skills generally describe the skills that individuals need for certain tasks. This may include some 'hard' digital skills, such as creating digital content, as well as **socio-emotional skills linked to the use of technology, for instance, digital collaboration.**"*

The term digital competency covers a lot of ground, but as the above categorizations indicate, there are some larger delineations we can apply to make it more manageable. This is a foundational understanding we can build on when examining the various digital competency frameworks in section 4.

3.2 Where do we acquire digital competency?

When we talk about acquiring competencies, it is useful to take a step back and consider where they come from, so to speak. How do people obtain knowledge of how to use a web browser, deal with extensions, develop a healthy scepticism towards possible fraud etc.?

Based on the interviews conducted we identified 5 broad areas of aquisition of digital competency. After identifying the 5 areas, we then analyzed the major contributing factors to digital competencies in each area.

We have made a visualization of the different areas of peoples lives that impact digital competencies - the channels of exposure to digital competency. The different elements of Figure 1, are arranged in terms of how close they are to the individual. This refers to which social layers might be considered from different stakeholder points of view (see Figure 2 for more). The channels of exposure are meant to serve as examples, and are not an exhaustive list. They are listed alphabetically. This overview will help situate the work in the following sections, and allows us to refer back to levers of acquisition of digital competency.

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[7] https://www.oecd.org/en/publications/developing-skills-for-digital-government_f4dab2e9-en.html

Proximity to the individual

Individual	Family	Educatio	Workplace	Society
Curiosity	Curiosity	Content	Environment	Discourse
	Occupation	External Collaboration	Leadership	Services
	Resources		Training	Regulation
			Work Style	

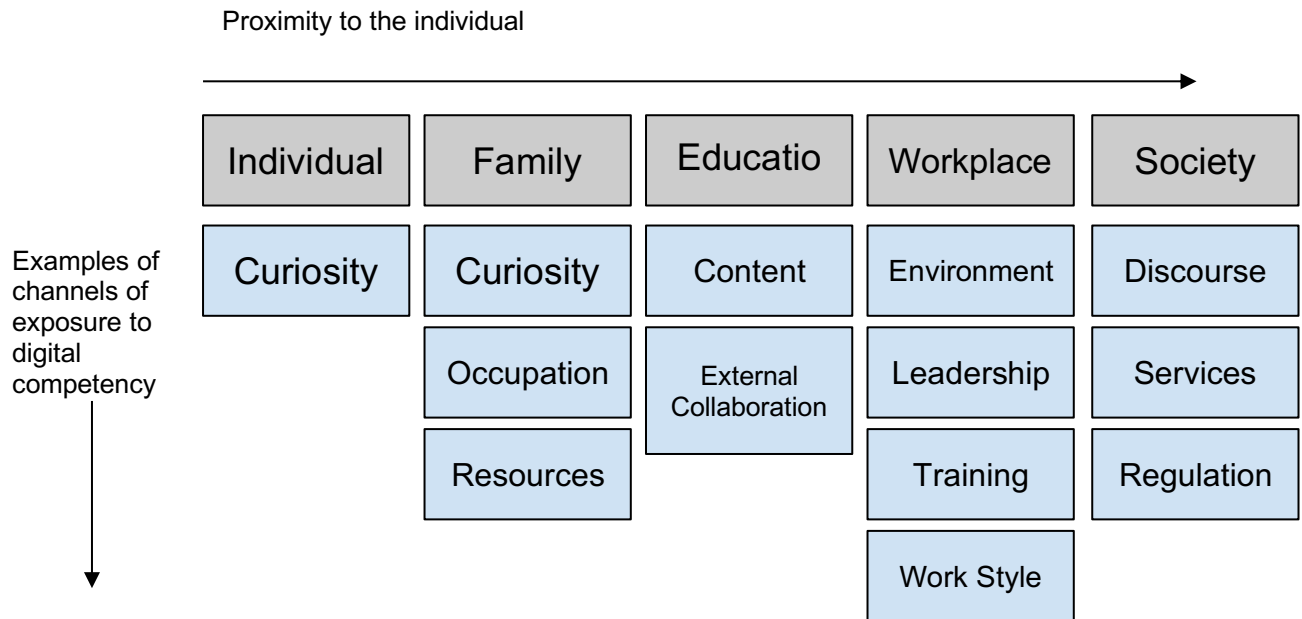Examples of channels of exposure to digital competency

Figure 3: Sources of Digital Competency

Individual

Individual learning often comes from curiosity. Some people are just more inclined to figure out how things work, and how to put them to new uses. There might be cultural factors impacting this, as well as socio-economic factors.

Family

The environment of the family is an important factor in determining whether people become curious about digital technology or not. Whether it is the curiosity of the parents that is passed on, or whether or not their occupation naturally makes it dinner-table talk. Availability of resources is also a factor, since some technology can be prohibitively expensive to certain households.

Education

Even if people do not get a specialized IT education, a lot of secondary and tertiary educational programmes have components such as written exams and group work, that develop digital competency. In the case of Denmark, Annemarie Holsbro from Teknologisk Institut told us that external collaboration is another area that educational institutions are betting on, to develop the necessary digital competencies of the modern workplace. This also aligns with what the digital development consultant in Haderslev municipality, Denmark, Jette Skriver, told us. One of the issues they see is that people coming out of education may well have digital competencies in terms of collaboration skills, information search and storage, but they often lack knowledge of the software being used to conduct business in the workplace. External collaboration can help alleviate this, and get young people transition to work life out of education more smoothly.

Company

The workplace is perhaps the place people immediately think of when it comes to digital competence. Of course, this is where the need for competence feels most acute. And so the workplace is also where we think of actively acquiring digital competence. As we will see in the following sections, this can happen through training, but also through leadership and

work style. If the leadership is not knowledgeable or encouraging of digital ways of working, this may hinder the acquisition of competencies in employees. If the work style is not adaptable, old technologies or procedures might hinder the acquisition of digital competency in employees. The work environment itself also plays a role, in that the technology that employees are obliged to, encouraged to or allowed to use, impacts what they need to learn and can learn.

Society
Society overall should also be considered a source of digital competence, however indirectly. The discourse in society determines what people talk about, and in turn what services in the public sphere are being digitalized. It is a common observation that private sector technology (for example smartphones, emails, social networks or banking) development increases the expectation of public sector services. As the public sector services catch up, which has been the case in the Nordics especially, where Denmark and Norway are located, the overall digital competency of the citizenry in general and employed populations in particular, get a lift. Societal regulation also plays a role, because the amount of and nature of regulation, may encourage or force people to learn about new digital interactions. Government issued e-ID solutions such as Denmark's MitID is a good example of this, because it forces people to use their devices in a new way. Another trend that hugely impacts what people need to know, is the push to make services more self-service focussed, which shifts the role of the employees too, as they will have to explain more and do less.

3.3 Who has an interest in acquiring digital competencies?

From a stakeholder perspective, it quickly becomes clear that individual digital competency is not simply an individual matter. Digital competencies among individuals affect the teams they are in, and the teams affect the organizations they are working for. The ability of teams to collaborate, and for managers to lead with digital competency are important parameters for digital transformation.
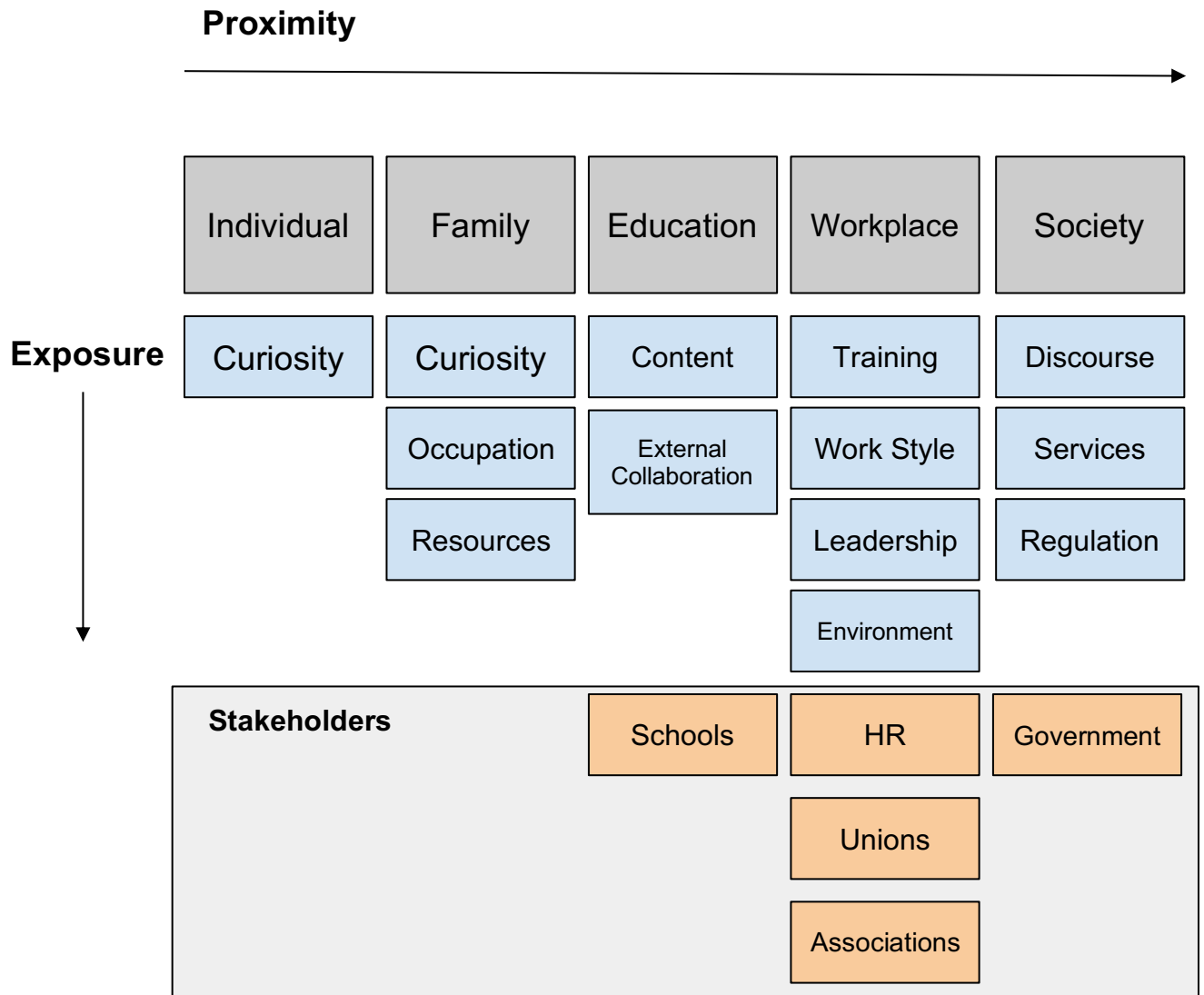
Proximity

Individual	Family	Education	Workplace	Society
Curiosity	Curiosity	Content	Training	Discourse
	Occupation	External Collaboration	Work Style	Services
	Resources		Leadership	Regulation
			Environment	

Exposure

Stakeholders

	Schools	HR	Government
		Unions	
		Associations	

Figure 4: Opportunities for Acquiring Digital Competencies across Stakeholders

There are also actors who are external to the single organization with clear interests and agendas for digital competency. These actors impact or have an interest in the digital competencies of that organization and/or its employees.

Whether we are considering digital competency from an intra-organizational angle or a wider policy angle, it should be meaningful to have an eye for what actors are at play.

Let's look at some of the kind of stakeholders we have encountered in our research.

Human Resources (HR)

Competency has always been an HR focus, but as the introduction of digital technology in terms of both hardware and software progresses, coordination with the more technical digital department might be necessary. In the case of Holbæk and Glostrup municipalities in Denmark, HR is involved in organizing digital competency acquisition activities, and they are closely collaborating with specialized internal development consultants, to make sure that competency acquisition and software purchases, for example, are aligned. But they also

create a relationship that helps leaders be mindful of how their traditional role changes with the changes in IT. As pictured in Figure 3, leaders are in turn helping change the mindset around digital in the wider organization.

In Holbæk, it is interesting to see how they try to strengthen the relationship between traditional roles, through the lens of digital competency.
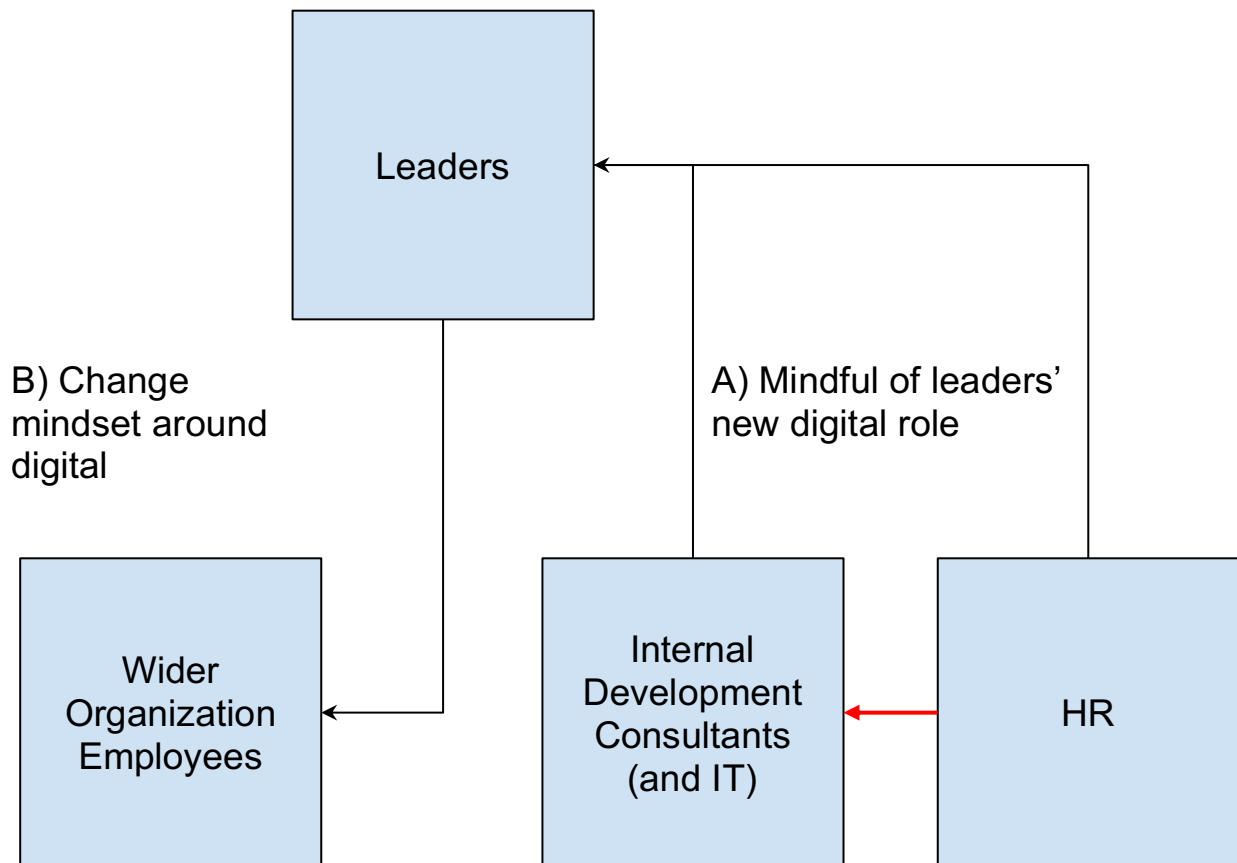
Figure 5: The relationship between leaders and employees

Education

As was noted above educational institutions are important stakeholders in acquiring digital competency in the next generation.

One of the things that is being done, is external collaboration through not only internships, but also through inviting employee organizations (unions) and employer organizations (associations) on to the boards of education, to discuss future content of certain programmes.

Unions

Unions have a focus on continuous learning. Their main concern is the job market and the situation of their members. This means that as digital technology transforms the way people work, the unions see it as their job and an opportunity to be attractive to their members, to remain aware of what kind of competencies their members need in the roles they are filling. As we will touch on later, they do this through offering continuous learning opportunities to their members.

Associations such as the Danish Association of Municipalities (KL) have a clear motivation to encourage and support the acquisition of the digital competencies of the employees of their members. As we will see later, they do this by creating networking spaces for the sharing of best practices.

The Norwegian experience is very much one of working towards changing how many players in society talk about digital competencies. The thinking is, that by getting everyone to talk the same language, society as a whole can progress more effectively in the same direction.

The Norwegian Directorate of Digitalization has limited funds, and so the mechanism they are trying to leverage is to make the model free to use, and encourage academia and large consultancies to use the model when they work on digital transformation projects. This spreads out the workload, and hopefully steers everyone in the same direction.

3.4 Why is it important to focus on digital competencies?

It is important to continuously invest in digital competency in the public sector, because people are increasingly met with new technologies that they could not have been prepared for during education.

OECD states in their paper Developing skills for digital government/ A review of good practices across OECD governments[8] (p11) that governments should invest in digital competency acquisition *rather than* mitigate the impact of new technologies on workers, societies and economies.

A changing technological landscape makes digital omnipresent
As Jesper Hosbond from the consultancy arm, Komponent, of the Association of Danish Municipalities (Kommunernes Landsforening, KL) says, no matter your job title in the municipality, you will need to have a certain level of digital competence. Even if it is just about taking a note or writing a decision in a case system, it has to be digital. In many cases, it is mandated by law, because digital technology allows for greater sharing and transparency with citizens. The trajectory of technological development also points towards data-driven, cross-departmental collaboration, which necessitates an increased focus on common digital competencies.

Workers are anxious to stay relevant in digital environment
As technology improves and jobs are changed or disappear, it becomes doubly important to help people develop their digital competencies, so they can adapt to the changing job market.

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[8] https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/02/developing-skills-for-digital-government_ea7d9105/f4dab2e9-en.pdf

We heard from HK, one of the biggest unions in Denmark, that members are increasingly calling to them about advice for acquiring their digital competencies, so they can stay flexible and attractive in a changing, digital job market.

Governments are waking up to the role of competency in digital transformation
As public sector organizations take on digital transformation, it is crucial that their employees are up to the task.
We heard from the Norwegian Digital Agency (DigDir), that digital competencies have been introduced in their digital strategy[9] for the first time in 2024, because the central government realizes that digital transformation can not happen without them.

We need to develop and implement specific training for digital competency, because the digital transformation that governments face is too important to leave entirely to the initiative of individuals.

Common expectations, but unequal starting points
Digital competencies are often tacitly expected of everyone, but not equally distributed in an organization. Some employees are further ahead than others, and a focus on digital competencies can help organizations make sure everyone catches up and that there is less digital burn out. There is a tacit expectation of digital competence, that when left undefined invariably will disappoint either employer or employee. It is crucial to at least bring forward digital competence as a category of discussion, in order to work better together.

All of the above points combine to underline the need to understand and talk about digital competency, and then invest in acquiring it with employees.

3.5 What makes it difficult to work with digital competencies?

A recurring question in our research has been about why digital competencies are underinvested in, and poorly understood.

Digital competencies are taken for granted
Digital competencies tend to be taken for granted due to the fast changing nature of the technological environment that our work is situated in. From hardware to software, from job descriptions to job titles, the way we work has been so infused with digital technology in the past 30 years, that it takes effort to really make clear what we mean by digital and specify what is needed to be digitally competent.

In even the most rudimentary jobs, you now need competencies that were far beyond anything required in the past. We heard a story from Holbæk municipality in Denmark, where the janitors who were tasked with painting the lines of football fields, suddenly had to learn how to operate painting drones.

Another implication of this issue, as Norway's digital agency, DigDir, pointed out in our interview: It can be difficult to gather political support and financing, because competencies

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[9] https://www.regjeringen.no/en/dokumenter/the-digital-norway-of-the-future/id3054645/

in general and digital competencies in particular are hard to quantify and are easily overlooked.

A bias towards narrow upskilling of workers, and forgetting managers
Another issue is where organizations focus on acquiring competencies. As we will show in this report, many practitioners stress the fact that digital competency acquisition all too often focuses on the employees rather than the leadership. Without a digitally competent leadership to guide the organization, the competencies of the employees will matter less. Leaders have to understand that digital is not about technology, but about what you can do with technology, as Jesper Hosbond says.

Lack of common language
Digital competencies are often obscured by a lack of common understanding and language of the subject matter. As new technologies enter the workplace and people's private lives at an increasing pace, there is less common ground to refer to and less time to consider it together.

The lack of a common language around digital competency in turn reflects a lack of understanding. This can create larger issues down the line, because issues that may in fact pertain to a lack of digital competence are harder if not impossible to talk about.

Combining this with digital competence being taken for granted, it can be hard to speak up about what the individual actually needs to know more about, to perform their tasks better.

3.6 Section Summary

The hypothesis of this research is that Denmark and Norway have a systematic focus on digital competency in the public sector. By looking at Scandinavian and international definitions of digital competencies, this section has explored how the concept of digital competence is being defined. It highlighted the importance of this skillset for individuals, organizations, and society.

The section outlined three key categories of digital competency: use, creation, and concept. It further broke down digital competence into knowledge, skills, and attitudes. The research team emphasized that digital competence is developed through a combination of individual learning, family influence, education, workplace experiences, and societal factors.

The section also discussed the challenges of acquiring and implementing digital competency initiatives, such as the tendency to take these skills for granted, a bias towards individual upskilling rather than leadership development, and a lack of common language and understanding around digital competence.

4 Digital Competency models and their implementation

In this section we will introduce 3 frameworks of digital competencies. A framework is a basic structure, which delineates an area of knowledge. In this case, the 3 frameworks draw different boundaries and include different categories of digital competence. They are chosen because they are 3 of the 4 frameworks highlighted by the OECD[10], and they cover the three different focus areas a framework can cover.

The 4 frameworks are:

- The European Digital Competence Framework (DigComp)
- The Global Skills and Competency Framework for a Digital World (SFIA)
- The Digital, Data and Technology Capability Framework (DDAT) (United Kingdom)
- The Model of Digital Skills (Denmark)

DDAT is deemed too technical for the purposes of this research, so the 3 focus areas are:
- Core digital skills (DigComp)
- Technical digital skills (SFIA)
- Skills for digital government (Organizational Capabilities for Digital Transformation) (The Model of Digital Skills).

This does not make one better or worse than the other. Rather, it helps further our understanding of what areas to look at when acquiring digital competence.

Common among the frameworks is that they seek to answer the question of what do people need to know, to navigate and thrive in digital transformation.

4.1 Digital Competence Frameworks

In the following we will outline the 3 chosen frameworks by introducing their background and development, the categories they cover and a brief analysis of their usage. In order to make comparison more accessible to the reader, the authors have converted the different layouts of the frameworks in to the same format of category and sub-category. The colors of the categories correspond to the ones used in the original designs.

4.1.1 Framework 1: The Digital Competence Framework for Citizens - DigComp 2.2

The Digital Competence Framework for Citizens - DigComp 2.2 is a framework that covers the general skills for citizens to possess in order to thrive in an increasingly digital society.[11] It is worth noting that this framework is not aimed at public servants in particular, but rather focusses on education of the broader populace. However all categories are not only relevant to the working population, but to the public servants too.

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[10] https://www.oecd.org/en/publications/developing-skills-for-digital-government_f4dab2e9-en.html
[11] https://publications.jrc.ec.europa.eu/repository/handle/JRC128415

Background and Development

DigComp is a framework offered by the European Union. It was first launched in 2013, and introduces 21 competencies that the European Union deems necessary areas for skills policy to reflect, in order to properly educate the citizenry.

Categories

Figure 6 shows the competency categories of the DigComp 2.2 framework.
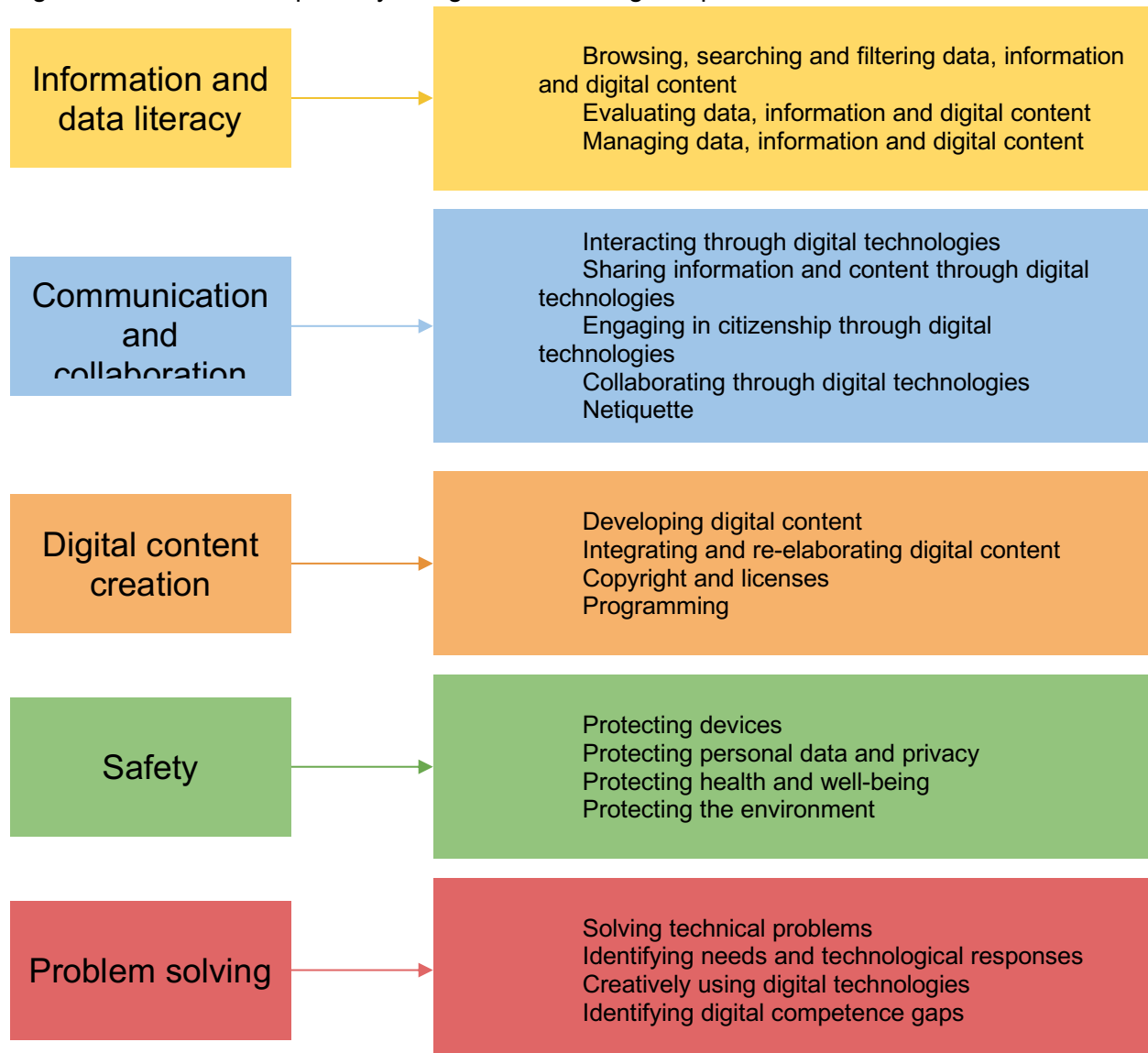
Information and data literacy	Browsing, searching and filtering data, information and digital content Evaluating data, information and digital content Managing data, information and digital content
Communication and collaboration	Interacting through digital technologies Sharing information and content through digital technologies Engaging in citizenship through digital technologies Collaborating through digital technologies Netiquette
Digital content creation	Developing digital content Integrating and re-elaborating digital content Copyright and licenses Programming
Safety	Protecting devices Protecting personal data and privacy Protecting health and well-being Protecting the environment
Problem solving	Solving technical problems Identifying needs and technological responses Creatively using digital technologies Identifying digital competence gaps

Figure 6: Categories of competencies in DigComp 2.2

Analysis

The framework is very broad, and is meant to address the fundamental competencies needed by the workforce to navigate the current digital landscape. It is important to note that this focus does not take anything away from the framework, because it is indeed the competencies of workforce that enables them to solve their tasks most efficiently on a day to day basis.

4.1.2 Framework 2: Organizational Capabilities for Digital Transformation

The Organizational Capabilities for Digital Transformation framework has a focus on the organizational and managerial aspects of digital competency. The framework focusses on the competency areas that must be covered in the organization for successful digital transformation. The framework has a focus on the role leadership plays in digital transformation, and is made to enhance the digital mindset of leaders, as they navigate the transformation of organizations.

Background and Development

The Organizational Capabilities for Digital Transformation framework is developed by DI2X in Denmark and was launched in 2019. It is based on the research by professor Pernille Kræmmergaard[12].

The framework has been introduced to most municipalities in Denmark, and has been adopted by some. See the case of Haderslev Municipality below in section 5.3.

Categories

Below is a figure of the categories and elements of competencies in the Organizational

Capabilities for Digital Transformation framework. The original framework figure can be seen

in section 1.2 in the resources and materials document.

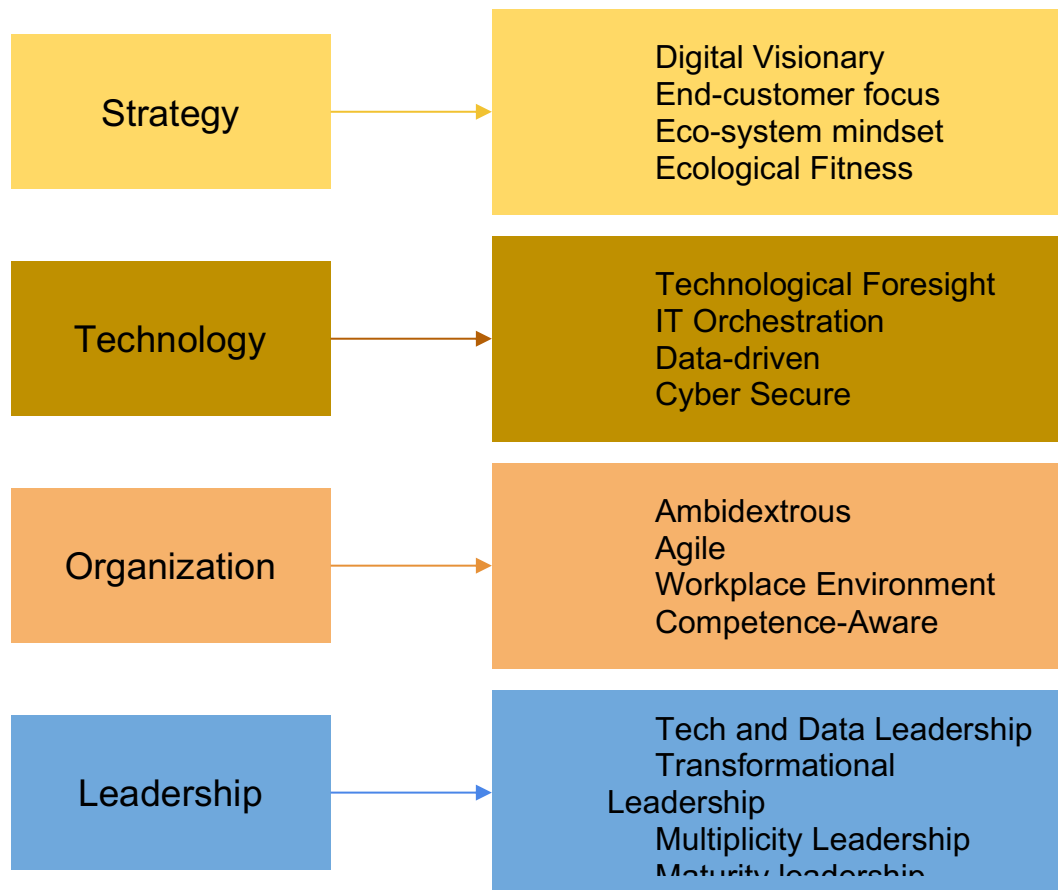[12] https://di2x.com/framework-organizational-capabilities/

Figure 7: Categories of competencies in Organizational Capabilities for Digital Transformation Framework (Reworked by authors)

Analysis

The framework is fairly focused on leadership, and only overlaps with DigComp in terms of data and security. The capability framework can be used both as a lens for the organization as a whole, but also as a lens for competence of individuals.

The inclusion of a strategy component is especially telling of the focus of the framework, and the thesis behind it. Without digitally competent leadership, a digitally competent workforce can only get so far.

The leadership category is also unique in this framework. For another brief example of digital leadership competencies, see knowledge box 1.

Knowledge Box 1

The Danish municipality of Holbæk works with 8 digital leadership competencies. While not being a framework per se, it is beneficial to reflect on more practical sides of leadership when it comes to digital competency.

1. How are you a digital leader?
   How do you make decisions, communicate and do teambuilding?
2. How are you curious?
3. Are you strategic and visionary?
   A lot of leaders want to do something now, but we have to realize that it's not a one off thing, and so there is a need to work with it strategically. It has to be enabled as a vision in meetings, so we can discuss the potential of new technology. The main issue mentioned is that it has to be legitimate to spend your time on it.
4. Do you invest in a digital culture?
   To enable employees to work digitally, but also as a leader to maintain and nurture it.
5. Do you understand technology.
   This refers to understanding the IT system the department has to use and the work processes around it.
6. Are you open and experimenting?
7. Are you brave and engaging with the unknown?
8. Are you flexible and agile?
   Try things out and have the courage to stop things again if it doesn't work.

4.1.3 Framework 3: SFIA 9

The SFIA 9 framework addresses the working population, but has an IT professional focus. The framework is included here as an example of what kind of competencies a fairly specialised framework incorporates.

Background and Development

Launched in 2000 it is run by the SFIA Foundation in the UK, a non-profit that aims to create a common language for the digital skills of the digital workplace[13]. The current version is 9, which was launched in October 2024. The framework is kept relevant through so-called open-consultation with industry, which leads to updates of the framework from time to time. The framework is used by at least 10.000 companies globally, as well as governmental institutions and individual citizens.

Categories

Below is a figure of the categories and elements of competencies in the SFIA 9 framework.

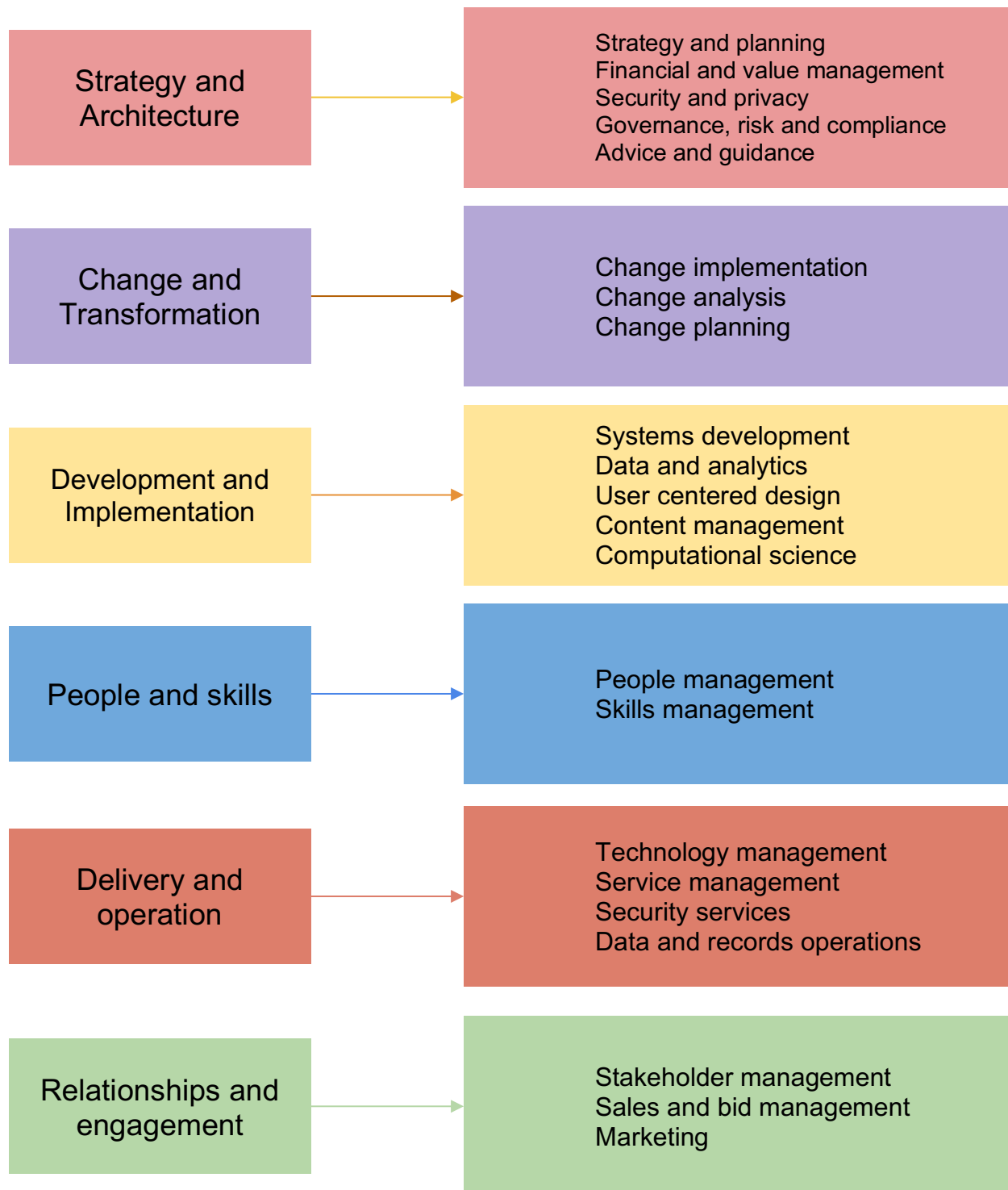The original framework figure can be seen in section 1.2 in the Materials document.

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[13] https://sfia-online.org/en/about-sfia

Figure 8: Categories of competencies in SFIA 9 (Reworked by authors)

Analysis

The SFIA framework consists of 5 competency areas with between 2 and 5 capabilities in each. The framework is focussed on what competencies are needed for the management of a digital organization. The absence of a category such as the digital visionary, says something about the managerial focus of the SFIA. While strategy and change is covered, it is a framework more tailored to upskilling key individuals within established career paths,

rather than lifting the workforce at a whole, or acquiring a digital mindset for leaders in particular.

4.2 Digital Competency Models

In the following we introduce three digital competency models that aid in implementing digital competency improvement initiatives.

Models are made of part of or all of what a framework covers, in order to operationalize the knowledge within.

The model selection has been based on availability and relevancy to the scope of the research. In the Scandinavian context, indeed globally as well, there are few instances of models operationalizing digital competency in the public sector context. They stand out in their applicability to the unique context of the public sector.

 The first model, The Digital Competence Wheel, is the only one of the three which is not specifically made for the public sector. Each model is outlined with a brief section on background and how it was developed and is maintained. We state the purpose of the model, and outline the elements of the model. This is then followed up with a section on how the specific model is implemented.

4.2.1 Model 1: Digital Competence Wheel (MapUs)

The Digital Competence Wheel is a model that makes the categories of the DigComp 2.2 framework more accessible via a graphical representation and an assessment tool.

Background and Development

The digital competency wheel is based on the European DigiComp 2.2 framework and was released in 2017. The private company MapUs read through the framework and built a suite of assessment software around it, that enabled companies and governments to leverage the insights in the framework in a more approachable way than simply distributing a PDF file.

Purpose

The purpose of the model is to simplify the DigComp framework, so more people can get the value it contains.

Elements

The digital competency wheel is a model consisting of four main categories: information, communication, security and production. The DigComp 2.2 framework includes a category called "Problem Solving" (included since version 1.0), but it is recognized that the category is "cross-cutting"[14]. This means that the category affects all areas. Security is likewise cross-cutting, but it was deemed essential to make it a stand-alone category in this model. These categories are then further broken down into subcategories that MapUs deduced from the

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[14] https://publications.jrc.ec.europa.eu/repository/handle/JRC101254

framework. MapUs typically display digital competency categories, and how well people measure up to them, as a radar chart as shown below (figure 8).
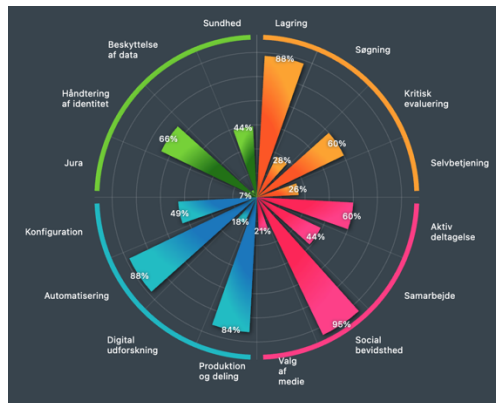

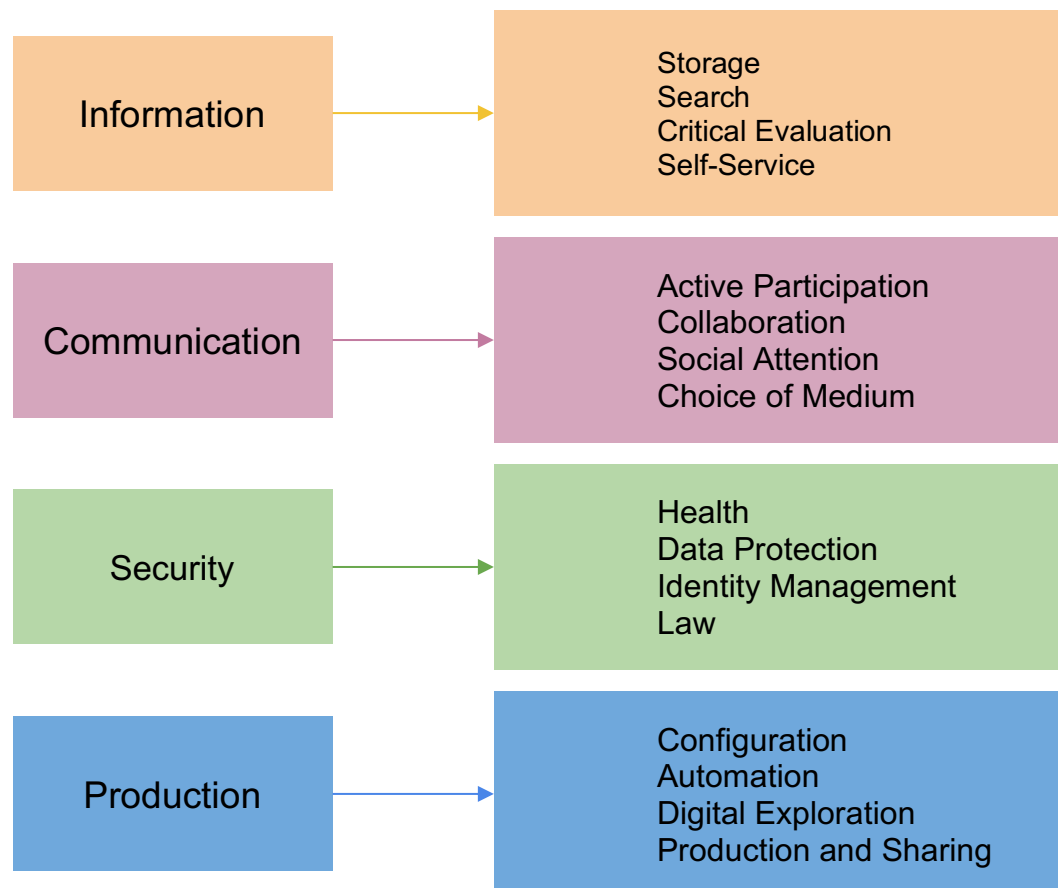*Figure 9: MapUs' Digital Competency Wheel*

Figure 10: Categories of competencies in the Digital Competency Wheel (Reworked by Authors)

Each subcategory is then further defined by a number of factors. An example could be the information category, which covers storage, search, critical evaluation and self-service. In the table below, we can see the kinds of factors that impact the information competency.
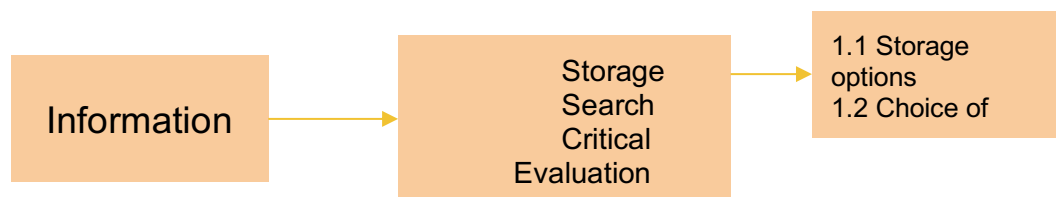
Figure 11: Categories of competencies in the Digital Competence Wheel broken down further into relevant factors

Implementation

The digital competency wheel is implemented in both private and public organizations via an online service that allows for easy assessment of a single user's competency level. This assessment can be combined with those of an entire team or organization, and thus provides an overview of what digital competencies are present in the team. This has been outlined in 5.2.1 below.

Table 2: Implementation of the Digital Competency Wheel

Framework	Model	Implementation Method
DigComp 2.2 is the foundational framework.	The Digital Competency Wheel delineates and arranges the factors of the framework.	**Assessment** The model is used to improve digital competencies via an online service that allows for easy assessment against the areas and topics outlined in the model.

As we will see later, this operationalization is crucial to assessing and acquiring digital competency in the workforce.

4.2.2 Model 2: Public Sector Digital Competency Model (Danish Agency for Digital Government)

The Public Sector Digital Competency Model covers the digital competencies needed by public servants to manage digital transformation projects.

Background and Development

Building on the competency wheel, the Danish Agency for Digital Government built out their own wheel[15]. The process they went through was longer and more tailored to the central government context with input from public servants, experts and international work in the field. This process has been documented in the previous research.[16]

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[15] https://digst.dk/media/eqopkgz1/model-for-digitale-kompetencer.pdf
[16] https://www.iais.or.jp/reports/labreport/20240618/digitalcompetency/

Purpose

It is an important point to note, that there is a long-running trend in the Danish government on all levels to talk about competencies in general, and to consider how each team member is contributing to the overall effort.

The fact that the Danish agency of digital government created a model like this, and used it in their digital government academy[17], is well in line with this general culture of talking about competencies.

Elements

The model of digital competency for public servants is a simplified, and focussed iteration of the digital competency wheel. The categories are much more specific to not only the public sector, but it is also tailored to managing digital projects, rather than upskilling the general workforce.

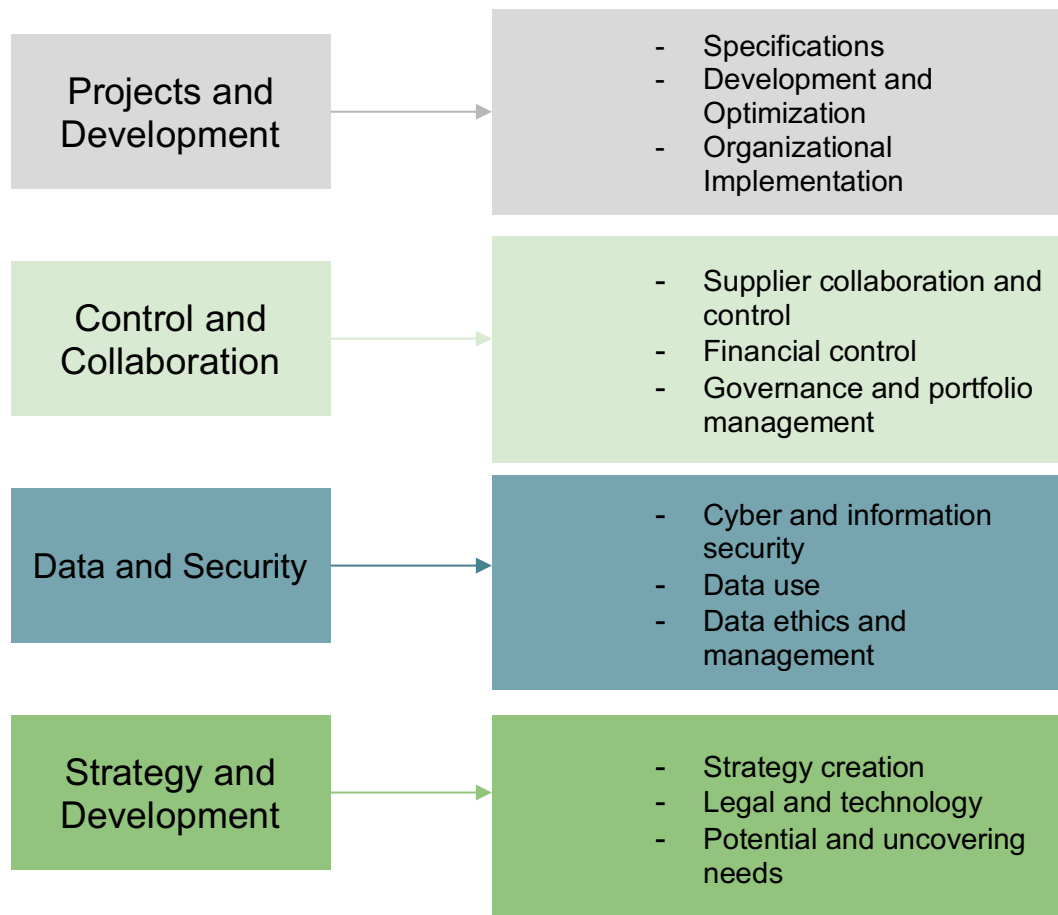*Figure 12: The Danish Digital Agency's digital competency wheel. Details of the categories can be found in figure 12.*

The areas and categories are detailed in figure 13.

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[17] The Digital Government Academy was a unit under the Danish Agency for Digital Government, that was dismantled in Autumn of 2024. The unit was tasked with curating and offering courses with the competencies needed across central government functions.

| Projects and Development | | - Specifications
- Development and Optimization
- Organizational Implementation |

Projects and Development	→	- Specifications - Development and Optimization - Organizational Implementation
Control and Collaboration	→	- Supplier collaboration and control - Financial control - Governance and portfolio management
Data and Security	→	- Cyber and information security - Data use - Data ethics and management
Strategy and Development	→	- Strategy creation - Legal and technology - Potential and uncovering needs

Figure 13: Categories of competencies in the Public Sector Digital Competency Model broken down further into relevant factors.

There is no section of leadership, and so the framework is very much directed at management of digital transformation initiatives.

Implementation

The public sector digital competency model is more statically implemented than the previous competency wheel, in that it serves mainly as a guide or frame of reference for the courses previously offered by the digital agency.

Framework	Model	Implementation Method
This model is not grounded in one specific framework, but rather draws on both various frameworks as well as practitioner and expert input.	The Public Sector Digital Competency model outlines the digital competencies public servants should acquire, or that should be present in government teams, to manage digital transformation initiatives.	**Courses** The model is used as a guide for courses offered by the now defunct Digital Agency Academy. The model acted as a common frame of reference for what each government department should be aware of in terms of digital competency.

The model was especially used as a reminder of the fact that all competencies can not be present in each individual, but should rather be present in each team or department. This insight helped pave the way for digital competency acquisition as-a-team, where teams learned to act better in their interconnected roles, rather than simply trying to up-skill an individual on any part of the model.

4.2.3 Model 3: DigDir Competence Model (Norwegian Directorate of Digitalization)

The DigDir Competence model situates digital competencies of public servants in political and leadership contexts. See diagram 10 for their visual relationship.
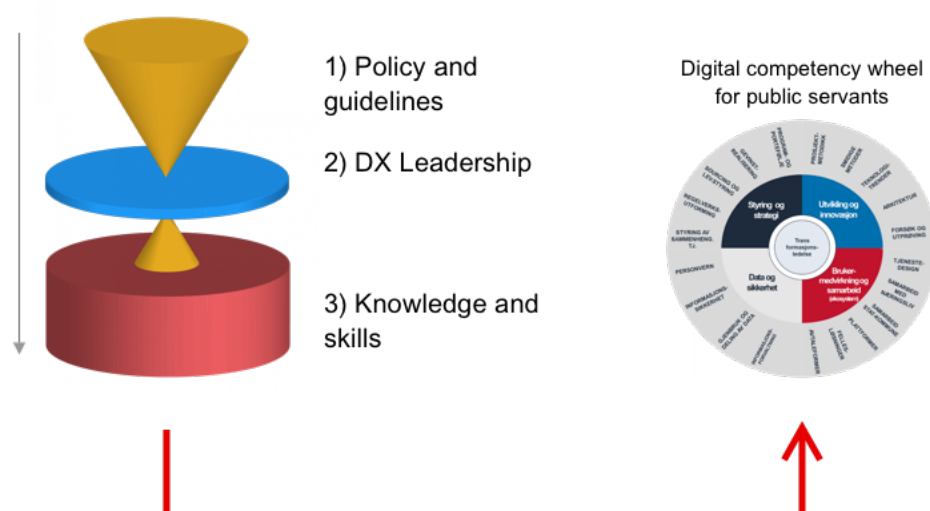

Figure 14: A diagram of how the Norwegian Digital Agency conceptualizes the relationship between their digital competency wheel (right) and the political and leadership contexts of the public sector. (left, yellow and blue). The digital competency wheel represent

Background and Development

The Norwegian Directorate of Digitalization (DigDir) has been building their own model since 2022 based on the Danish competency wheel[18]. The Norwegian model adds some elements to reflect the context that the model will be deployed in. This is an important reflection, because the Norwegian administrative environment is not so far removed from the Danish. It is therefore less a matter of adaptation of content, and more a matter of making the content better accessible to the discourse of digital competency in Norway.

The model is also influenced by the work of DI2X and thus has a clear leadership level as well.

Purpose

The purpose of the framework is to give direction to the acquisition of digital competencies in the Norwegian government, and provide a common language for digital competencies in Norwegian society.

Elements

The model consists of three parts. The policy and guidelines of the top part are channeled into the leadership of digital transformation. Policy and guidelines are then distilled by leadership into digital knowledge and skills for and the broader organization.

1 Policy and Guidelines
By introducing a policy and guidelines layer, the model is taking into consideration the characteristics of the public sector context it is situated in. This is something characteristic of the Norwegian model that sets it apart from the Danish model.

This level refers to laws and strategic documents from the central government and the EU that sets the scope of digital competencies.

2 Leading Digital Transformation
By including a level with specific emphasis on leadership, they want to recognise the importance of how leaders can think and act to make a digital transition happen. By situating the digital competencies of employees in the context of policy and leadership, the model presents an opportunity to deal with digital competency acquisition systemically, and increase efficiency of digital transformation initiatives.

3 Knowledge and Skills
The red base-layer is the competence and skills layer. This is what is common with the Danish model.

Knowledge and skills are broken down in a manner akin to the Danish competency model,

but it has been tweaked based on the needs of the Norwegian government, in relation to the

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[18] https://www.digdir.no/digitalisering-og-samordning/ny-kompetansemodell-digital-transformasjon/3374

developmental stage they are in. This can be seen in the DigDir Competence Wheel Model in section 1.2 of the Materials document.
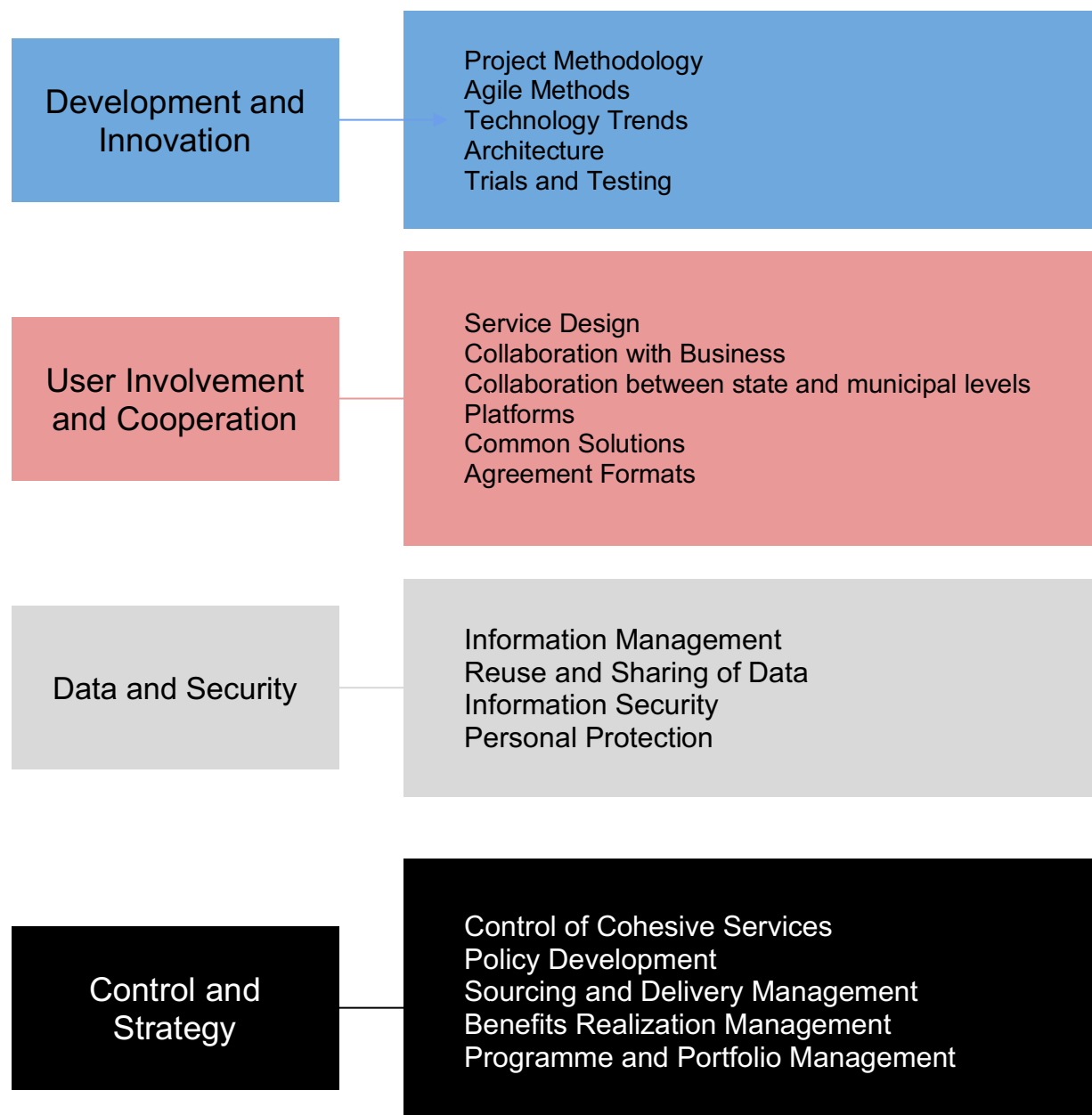
Figure 15: Categories of competencies in the DigDir Competence Wheel Model

Implementation

The DigDir competency model is implemented on a strategic level, as it is meant to give a shared sense of direction to thousands of municipal leaders and employees across Norway. The model is part of a larger strategy by the Norwegian Directorate of Digitalisation, to encourage adoption by non-governmental actors, so the whole of society can nurture the same understanding of digital competencies and their importance.

Framework	Model	Implementation Method
This model is not grounded in one specific framework, but rather draws on both the Danish Digital Agency's model outlined above, as well as Norwegian expert and practitioner input.	The DigDir Competency model outlines the digital competencies public servants should acquire, or that should be present in government teams, to manage digital transformation initiatives. The model breaks down the relationship between politics, leadership and digital competency.	**<u>Strategy</u>** The model is implemented as strategy, as it sets direction for the role of digital competency, but also in that it shows the placement of leadership in relation to digital competency and digital transformation. The strategic impact on the broader government effort, is that they have a common language. It helps situate discussions at the appropriate level.

The model has been introduced to over 300 municipal leaders via multiple workshops. While it was challenging in the beginning to convince them of the need for the model in the first place, the head of digital in Kristianssand municipality in Southern Norway Mrs Ann-Helen Moum, said that after the introduction, participants were thrilled that they now had common direction and language, which they had not realized the needed until then.

4.3 Focus of frameworks and models

4.3.1 Focus and sectors of frameworks and models

Between the three frameworks is a movement from general, individual competencies, to competencies that are highly relevant to the more specialised work of leading and implementing digital transformation.

The inclusion of strategy and leadership in the latter two especially, underline their focus on digital competency in terms of leading digital transformation. The general skills laid out in DigComp can be said to help the workforce as a whole navigate the digital landscape.

The differences are not saying anything about which framework is better or more appropriate, but we better understand the applicability of each by arranging them in relation to each other.

Table 5: Overview of the Focus Areas of Competency Frameworks and Models

Framework Name	Focus	Sector
Digital Competency Wheel	Basic Digital Competency	General

Organizational Capabilities for Digital Transformation	Leading Digital Transformation	General
Norwegian Directorate of Digitalization - Competence Model	Managing Digital Transformation	Public Sector
Model of Public Sector Digital Competence	Managing Digital Transformation	Public Sector
DigComp 2.2	Basic Digital Competency	General
SFIA	Managing Digital Transformation	IT

4.3.2 Establishment and comparison of digital competency models and frameworks

Based on the analysis of the frameworks mentioned, we can see there are different ways to approach the making of the framework, which carry different workloads.

1. **Review**
   Analyze existing research and make it available in a more approachable format.
2. **Contextualizing**
   Analyzing existing research and combining it with first hand investigations of the needs of the particular context of the digital competencies.
3. **Comprehensive**
   A recurring industry wide effort organized by a central body.

Table 6: Comparison of Development Methods of Competency Frameworks and Models

Framework Name	Way of Establishment
Framework 1: DigComp 2.2	3: Comprehensive
Framework 2: Organizational Capabilities for Digital Transformation	1: Review
Framework 3: SFIA	3: Comprehensive
Model 1: Digital Competency Wheel	1: Review
Model 2: Public Sector Digital Competence	2: Contextualizing
Model 3: DigDir Competence Model	2: Contextualizing

The frameworks presented here are all from western countries, and so there is a risk of a cultural bias in what the frameworks contain and omit. It is beyond the scope of this research to define what a digital competency for the specific context of Japan might contain but suffice it to say that the relationship between the organizational culture of Japan, the level and way of technological adoption all potentially play a role in what kinds of categories might be meaningfully included.

4.3.3 Comparison of implementation approaches of digital competency

The 3 digital competency models examined for this research, are implemented in different ways. These different implementation methods are not mutually exclusive, but each of the different methods highlights approaches to connect theory and practice in terms of digital competency.

In order to show how digital competency models are best implemented, we should first identify the elements that are common between the methods of implementation presented above.

Table 7: Comparison of Implementation Modes of Digital Competency Models

Assessment	Courses	Strategy
Unique elements		
- **A1 Operationalized through software** The assessment mode of implementation takes a hands-on approach to the model. - **A2 Individual Focus** While aggregate assessment can say something about the whole organization, the starting point is the assessment of the individual.	- **C1 Reference point** The courses mode of implementation uses the model as a frame of reference. - **C2 Team Focus** Though courses can be attended on an individual basis; as an implementation mode there is more of an emphasis on team-training to cover the necessary digital competencies outlined in the model.	- **S1 Ecosystem Focus** To use the model in outward facing ways, to build a common understanding. - **S2 Planning** The strategy mode of implementation is geared towards leadership, and coupling digital competency with the direction of digital transformation.
Common Elements		
- **CE 1 Common language** The creation of and emphasis on common language as an element of implementation is common between the three modes of implementation. While each model in itself is a way to capture a common language, it is in the implementation a given model that this is put to the fore, whether it is in terms of assessment on equal terms, courses with a team or an ecosystem wide endeavour to build consensus around an approach to digital competency. - **CE 2 Leadership** Especially in conjunction with digital transformation, the inclusion of leadership in each implementation mode is telling of what needs to be done when working with digital competency in the bigger picture.		

4.4 Summary

The frameworks introduced here cover digital competencies from different angles, which is defined by the context they have evolved from. Frameworks have to walk a line between general applicability and technical detail. A general perspective, such as DigComp, and the applicability of the framework is broad but thin. A more leadership oriented framework such as the Organizational Capabilities for Digital Transformation framework, is more specific and less applicable in the broader workforce.

Likewise, the public sector focus on the Danish and Norwegian digital agency models present a very focussed set of competency categories. These frameworks are good

examples of the need for contextualization, when acquiring a competency model for a specific sector.

As we will see in the next section, we can combine the different implementation modes of digital competency models, to better develop digital competencies.

5 How to Develop Digital Competencies

5.1 Considerations for Digital Competency Model Implementation

There are different ways to deploy a model once it has been completed. One of the ways organizational learning and progress fails is in overestimating employees' ability to put written insights into action. Another way they fail is to not develop a process around the model.

The first point to be made about the tools that utilize the models and frameworks of digital competency, is that they allow for assessment. As has been discussed in our previous research on the subject of digital competencies, they seem hard to grasp and quantify, especially as they are often taken entirely for granted.

Without a robust way to assess the actual needs of each individual and the team in total, upskilling courses are bound to be hit or miss, which carries the risk of intimidating less digitally competent employees, and demotivating the more competent ones.

In addition to the actual assessment solution itself, having a ladder of progression based on the frameworks, enables leaders and employees alike to have a fact-based conversation about where they are and where they would like to go.

5.2 Development process around a Model

Through the present research, the authors have compiled the following example of a development process around a competency model in Figure 12. The orange boxes represent the applicability of the different implementation modes outlined in the previous section. See section 5.1.1 for a case study that shows the flow in a real world setting.

The example ties together digital strategy and digital competency model implementation, and is a generic representation that could work in both public and private organizations.
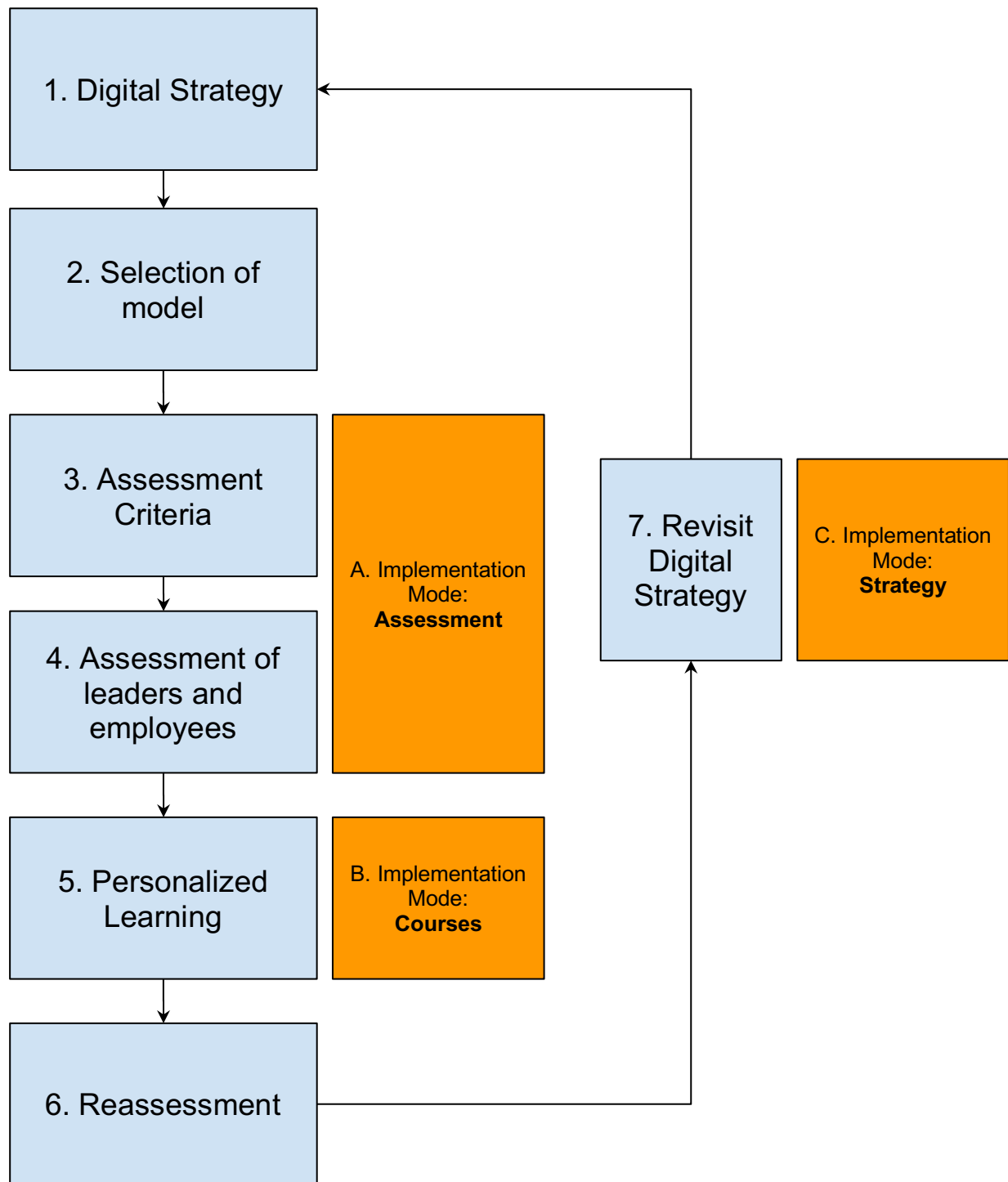
Figure 16: A model flow of Digital Competency Models impacting Digital Strategy

1. Digital Strategy

Competency and strategy are closely linked, in the sense that competency is what will allow the strategy to be realized over time. It can be said that it is not necessarily a digital strategy, but could be the digital component of a larger strategy.

2. Selection of model

Based on the context and capacity of the organization, an appropriate model can be made or adopted.

3. Assessment criteria

As the model is situated in the digital strategy, the appropriate assessment criteria will emerge.

4. Assessment leaders and employees

There is a strong connection between leadership and digital competency, as leaders need the competency to lead transformation. Assessment of leaders is paramount to the progress of digital transformation.

Assessment of employees should be undertaken, to get a sense of what competencies are represented in the organization, and where those competencies are.

A. The assessment implementation mode can be used here, to lay the foundation for individual digital competency levels to contribute to a larger digital strategy.

5. Personalized learning

Based on the assessment results, the combination of strategy and competency model can provide insights into what kind of development regime is most appropriate. This might be personal, or it might be mandatory, or it might be continuous. This is also dependent on the resources available.

B. The courses implementation mode can be used here, to use the selected digital competency for appropriate individual and team training. Personalized learning should be understood as also bringing in the individual-in-a-team perspective.

6. Reassessment

Reassessment after learning enables the organization to evaluate what works and what doesn't.

7. Revisit Digital Strategy

Based on the reassessment, the organization can also revisit the digital strategy, to see whether they can go further with a more competent workforce, and where that might be. See knowledge box 2 on The Digital Maturity Generation Model of digital transformation, which suggests a relationship between digital strategy, digital maturity and digital competency.

C. The experience of the Norwegian Digital Directorate shows that digital strategy, digital transformation and digital competency are supporting each other. Combining this insight with the Danish experience of acquiring strategy based on assessment, we can use the strategy implementation mode here to connect the digital competency level of the organization with the broader goals.

Knowledge box 2: The Digital Maturity Generation Model

The digital maturity generation model by DI2X in Denmark[19], is interesting because it emphasises common language at each step of a digital transformation journey, and thereby creating the foundation necessary to discuss competencies necessary at each step.

It is a staircase model, where each level is supported by the ones below it. The insights and measures of the first generation do not disappear or are thrown away as you move up.
This represents the acquisition of the mindset.

In the first and second generations there is a need for competencies of use - creating and using self-service solutions, for example. This is where the competency wheel is most applicable, as it works less with the developmental aspects of digital transformation.

From generation 3 and onwards, the competencies required become more conceptual, and it is stressed that having digitally competent leadership is essential to attaining these levels of digital maturity of the organization.

By pinpointing where an organization is on the maturity model, it becomes clearer what is needed for a digital strategy to encompass, in order to move further up the staircase.
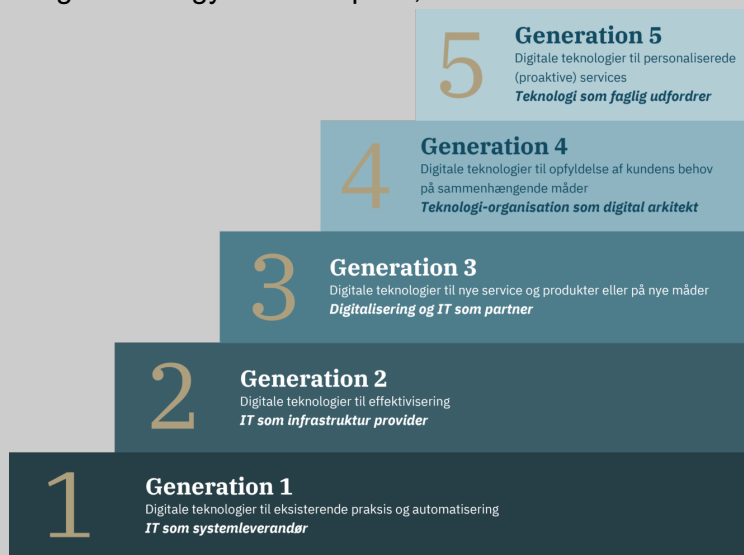
5.3 Case: Combining Strategy and Digital Competency Acquisition in Haderslev Municipality, Denmark

To illustrate the connection between digital strategy and digital competency from Figure 11, the case of Haderslev Municipality in Southern Denmark is especially apt. The case highlights not only how digital competency acquisition should be a key component of digital strategy, because without competencies no one can lead the transformation. But also how the competency of leadership is fundamental to lead the whole organization towards a bigger, strategic goal.

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[19] https://di2x.com/framework-digital-maturity/

Background

Haderslev Municipality is a rural municipality in Southern Denmark close to the border with Germany. The municipality has 55.000 residents and approximately 4500 staff in total.

In 2021, their old digital strategy expired and they needed to create a new one.

Approach

Haderslev Municipality used a combination of models to arrive at a path for their digital competency acquisition.

They used the Digital Maturity Generation Model (see knowledge box 2) from DI2X to determine where they were and where they wanted to go. Management made the bold aim to aspire to reach generation 4 by 2025, even though few if any municipalities in Denmark has actually reached generation 4.

In order to make the implications of the goal clear, they needed to make ambitions of a digital strategy specific, and create a common language among top management. A working group found that there were considerable gaps between the competencies they could observe, and what departments felt themselves.

The concept 'digitalization' can be difficult for subject matter experts to work with. Digital competency is not obvious to them, and so it was first and foremost a challenge of creating common understanding through talking and visualization.

The competency wheel was used as an exercise among management, to explore their baseline - a gap analysis. When the baseline was established, and they all knew and agreed on where they were in terms of the different competency areas, they could much more convincingly move on to consider what to do next.

Leadership

While they have yearly employee one-on-one's and leadership development conversations, they realize the importance of actually having a common language and understanding to talk about development through. This is part of the reason why they focus on management first, because if managers do not have the language and competencies, they can not ask the right questions or guide employees on their best paths.

The digital transformation must be important to all employees, and this requires management to create a frame of mind, structures and ecosystems for this in the organization. This requires digitally competent leadership.

When asked, leaders understand that they need to develop better digital competence, but they say they have a hard time making the connection between the technology and their problems. This points to a weakness in how technology is often introduced with a focus on competence of use, where solutions are introduced individually, leaving it up to people in the department to figure out how to suit their situation.

Status

They are currently working on defining concrete initiatives to strengthen digital competency throughout the organization. They know that they need digital competencies to succeed in other areas.

5.4 Tools and Practices for Acquiring Digital Competency

During this research we encountered different tools and practices to develop and maintain digital competency in public sector organizations. Among the things we heard during our research, that municipalities and governments were doing in terms of improving digital competency, these were the most straight forward and easily reproducible. The tools can be part of an organization's continuous improvement of digital competency.
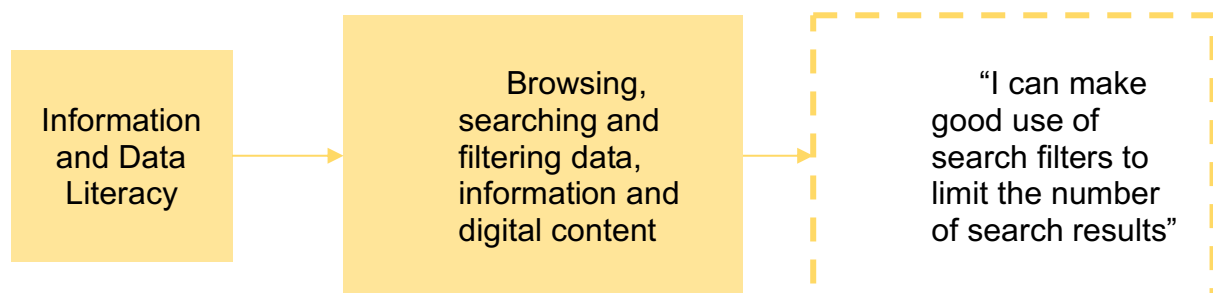
5.4.1 Tool 1: MapUs Assessment

MapUs is a Danish company that offers an online assessment tool. Their main offering is an assessment based on the DigComp 2.2 framework from the European Union.

Background

MapUs' assessment tool is the interactive part of their competency wheel introduced in section 4. The tool is publicly available, and advanced access can be purchased to customize the tool to fit the needs of the particular organization.

Purpose

The tool basically answers the question, "how do you know if you know?". MapUs made this work by thinking about the actions, mental models and speech acts that indicate a grasp of the given competence. If we take an example from the DigComp framework introduced in section 4, we can see how they have identified a question to the right, where the answer would indicate the level of competency of that particular competency category.

Figure 17: Connection between larger category, and a question that serves to shed light on a user's understanding

Usage

The MapUs assessment software uses an online interface to take users through the questions.
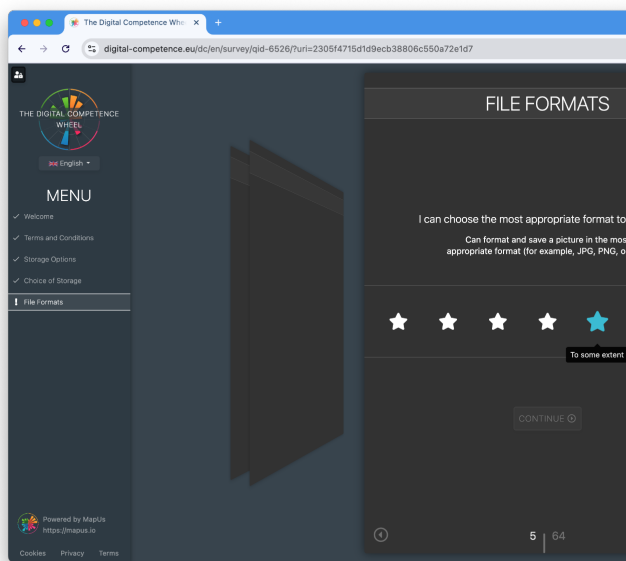
The assessment interface is based on a series of questions, presented as cards.

Image 1: Cards interface of MapUs Assesment tool

Based on the answers, each participant can see how they scored, and the organization can see how an entire team or department scored. This makes it easy to identify which areas to provide learning opportunities within.

Image 2: Result interface of MapUs Assessment tool

Combining assessment with learning is a great way to deal with the challenges of digital competency acquisition.

MapUs suggests a workshop format where individual assessment is carried out either immediately beforehand or during the session, with the results then displayed on the screen. This provides a foundation to open up a conversation about what each of the competency categories are, where the gaps in knowledge in the team are, and this can in turn lead to a more focussed discussion about what to do in order to improve.

Although a broad discussion of strengths and weaknesses is valuable in itself, a less tangible outcome is the natural alignment that occurs when people are in the same room,

and questions can be asked about the meaning of specific words and concepts in the context of their work.

Outcomes

A clear view of where the individual and organization is in terms of digital competency, which, if used strategically, can create the foundation for personalized learning as well as a common language around digital competency.

5.4.2 Tool 2: Competency Profiles

Competency profiles are personas which specify a set of competencies required for a given role. This adds specificity to the role, and clarifies what individual workers or leaders should know in order to best contribute to the organization.

Background

HK is Denmark's second largest trade union representing clerical workers, workers in retail, and in related industries. As a union, their focus is on the development and success of their members, and one of the ways they help with this is to enable members to navigate the changing job market.

Purpose

Competency profiles provide a general overview of the kinds of competencies workers might need in the future.

Usage

Within 13 identified job functions, HK has developed competency profiles for different roles. As an example, the Administrative Worker function is divided into 5 roles[20]. Each role is described by content as well as what technological trends are impacting the role in the future.

Here's an example of "The Expert Caseworker"

Table 8: Breakdown of the competency profile for "Expert Caseworker"

Role: The Expert Caseworker	
Work Assignments	Developmental Tendencies impacting the Expert Caseworker
- Case work - Citizen service - Control and observation - Citizen communication	- Continued digitization of the municipal organization. - Increased demands on efficiency and cost cutting. - Municipal paradigme shift from management-led service business to

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[20] https://www.hk.dk/omhk/sektor/kommunal/kompetenceprofiler/kompetenceprofil-administration

| | political leadership of actively engaged citizens. |
| | - Co-creation of welfare solutions with citizens and organizations |

While the profile does not point to specific competencies within each developmental tendency, it provides ample guidance in considering what competency areas the employee can choose to improve in. For example, while the first developmental tendency of continued digitalization points to digital competency in general, the last developmental tendency of co-creation of welfare solutions points to the collaborative aspects of public service in a digital age, that requires for instance competency of concept as highlighted by prof. Pernille Kræmmergaard (detailed in section 2).

Similarly we heard from Holbæk municipality in Denmark, that making clear profiles of competency, based on assessment, can aid in recruitment, because it is much easier for a team to say what kind of competencies are already present in the team, or what the profile of someone leaving a certain role, was.

Outcomes

The tool creates an easy way of assessing what needs to be worked on, and then talk about how to go about it. The tool helps to show what ways to grow for their members.

Compared with the competency wheel and the assessment tools, the competence profiles are for specific roles.

5.4.3 Practice 1: Peer Networks

Peer networks are networks of people in similar roles or at similar levels across an organization.

Background

Peer networks consist of people within the same function in different organizations. In our research we heard from both of the individual municipalities Glostrup and Holbæk in Denmark, as well as the association of municipalities in Denmark, KL, that participation in peer networks is encouraged.

Purpose

They are gatherings that are meant to create a space for sharing of expertise in both formal and informal and directed ways.

Outcomes

The experience of Holbæk municipality is very telling of the value of peer networks. The IT department organises a peer network, and uses it to stay involved with their colleagues' everyday worklife, as well as making their technological insights stay relevant to others, who are not necessarily thinking about new technology every day.

We heard from Glostrup municipality that time is a huge negative factor for succeeding with maintaining digital competency. This has to do with the fact that technology is evolving faster than adoption can happen in the workplace, which over time leaves people behind the digital competency curve. Peer networks are a key component of continuous learning, rather than one off courses or events. They promote active membership and participation in learning.

5.4.4 Practice 2: Offering Learning Opportunities through online platforms (LMS)

Learning Management Systems are online resources of videos that people can access as they need. Combined with an assessment regime, LMS allows for personalized learning.

Background

Based on the assessment of competency, offering more directed learning opportunities to individuals is an important practice to develop digital competency.

HK is offering their members access to a Learning Management System (LMS), to ensure that members can learn what they need to, when it suits them.

Purpose

Learning opportunities can come in many forms, but combining the personal need for learning in a particular subject, with the flexibility of an LMS, is a great way to ensure that people learn more of what they need to, and less of what they don't need to.

The one-size-fits-all of more traditional, face-to-face courses can be demotivating for workers who are already fairly digital competent.

Usage

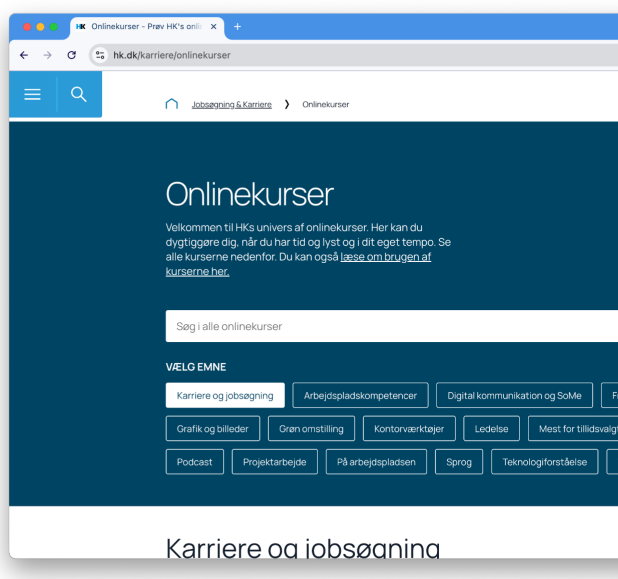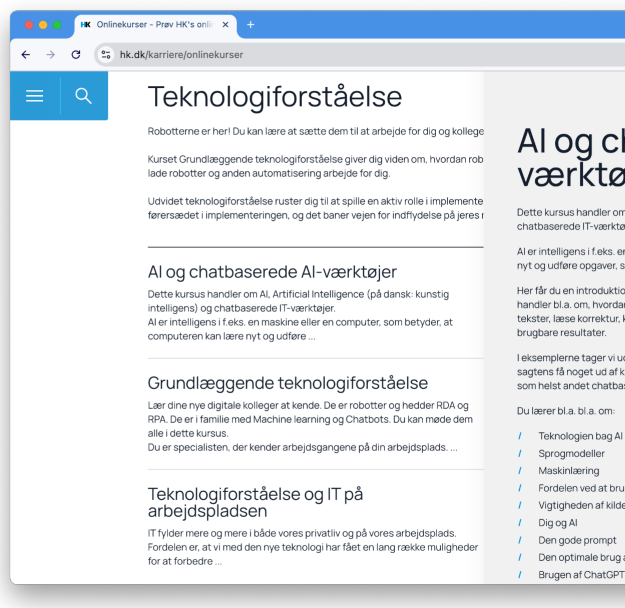The online portal for courses and information that is of general interest to members of HK.

Image 3: LMS interface of HK

One of the categories pertaining to digital competency is "Technology Understanding". This contains foundational courses in modern technologies set to enter the workplace such as generative AI.

Image 4: Example of an LMS category

Outcomes

Personalized learning can develop competencies in the areas that a person or team has been assessed to be lacking in.

New technology is not always immediately obvious to everyone, and so making learning opportunities available to people can help them stay engaged.

5.5 Section Summary

This section has shown how the Scandinavian societies of Denmark and Norway to go about acquiring digital competencies in the public sector. First of all it was suggested that there is a connection between digital transformation, assessment of digital competency and personalized learning. Second, the section introduced four ways to develop digital competency that are being used in Denmark.

6 Conclusion

The present research examined the hypothesis that a systematic focus on digital competencies contribute to the advancement of digital transformation in leading digital societies like Denmark and Norway. Through this research, several things have become clear that support this hypothesis, and underlines the importance of digital competency in acquiring a digital public sector.

6.1 The understanding behind a systematic focus of digital competency

In the first section of this report, the authors examined what kind of understanding of digital competency is behind the systematic focus, and from this we could develop a working definition.

The following four insights summarize these findings.

1. We need to talk about digital competency, if we want to improve on them. The first step for a lot of organizations is to create a common language.

2. Digital competence is a core component of digital transformation, and has to be worked with systematically in order to gain efficiency.

3. Regular team assessment can help with hiring, because if someone leaves the team, it is fairly easy to see the skills they took with them.

4. Societal mechanisms like workforce mobility and the role of unions, the accessibility and collaborative stance of educational institutions, play a role in raising the average of society.

6.2 Digital Competency Models and Their Implementation

We held up Scandinavian models of digital competency against international frameworks of digital competency, to examine further what a Scandinavian systematic focus on digital competency entails.

The following four insights summarize the findings in this area.
1. Digital competency is not only a workforce issue, but very much also a leadership issue.

2. Assessment helps with creating a common language, if it is done in conjunction with acquisition activities such as workshops.

3. A common assessment makes employees more mobile, and better equipped to talk about their own advancement.

4. Working with frameworks is about establishing a common frame of references, and it is valuable to make the frameworks interactive, rather than simply offering a list of competencies.

6.3 How to Develop Digital Competencies

Building on the understanding of digital competencies and the way the Scandinavian models of digital competency operationalize the concept, the research could look at human resource development through the lens of digital competency. It became clear that the Scandinavian systematic focus on digital competency is also enacted through the use of tools and practices that combine to increase the level of digital competency across the public sector. These three insights summarize the findings.

1. Acquisition of digital competency benefits from a clear link between digital strategy and an appropriate competency model.

2. Whether digital competency upskilling stems from push or pull depends on the labor market structure.

3. Digital competency training can take different paths, but interactive learning through real time assessment is valuable, because many people lack the language of digital.

6.4 What this means for Japan

It is clear that there are various frameworks of digital competencies, and that some are more general or specialised than others. With digital competency still being a fairly obscure area for many, engaging with the framework most appropriate to the stage of digital maturity a given organization is at, will help create a common language. A common language can be the foundation for continuous assessment work, which in turn will help reveal the needs for personalized learning that organizations can invest in.

Perhaps the biggest point to take away from the present research, is that Japan can get very far very quickly, by adopting a more systematic focus on digital competency akin to the way the Scandinavian societies of Denmark and Norway are doing it. The systematic focus will in turn guide the application of tools and practices most meaningful to the Japanese context - focussed assessment being potentially a very big first step in this.

This can in turn increase efficiency of digital competency acquisition, and strengthen the digital transformation efforts if aligned with a digital strategy.

7 Acknowledgements