Towards a healthy life through digital health innovation

– DigitalWell Arena at half-time

Preface

Since the start in 2019, the work and development of the DigitalWell Arena Vinnväxt initiative has been followed by researcher Emily Wise, at Lund University. The assignment as a has specifically been to follow the initiative's journey based on systemic effects and contributions to transition and transformation. Emily has continuously, on a weekly basis and through annual summaries documented important events – both positive and negative, interviewed actors in the environment and moderated bilateral conversations.

As an investment and ecosystem, DigitalWell Arena has achieved a number of results and, above all, new insights. Prior to the initiative having completed 5 out of 10 years as a Vinnväxt initiative, the need to gather these is identified. It landed down in this mid-term report. The report is a stand-alone document and should not be mixed up with a strategic plan for DigitalWell Arena. However, it reflects the work that has been done and is a compilation of activities and effects seen from a researcher's eyes. Now that we are at half-time.

Emily's work has been and is an important support for the process management to follow and analyse the development of DigitalWell Arena. The report is very valuable both for us and for the DigitalWell Arena ecosystem where the projects that are run can be reflected through Emily's eyes – with an outsider's perspective. It gives us as process management important insights into how our work is perceived and to become better at conveying the overall picture.

We welcome input from those of you who read this report regarding the work done during the first five years, as well as the development going forward.

Enjoy!

Process management, DigitalWell Arena

Contents

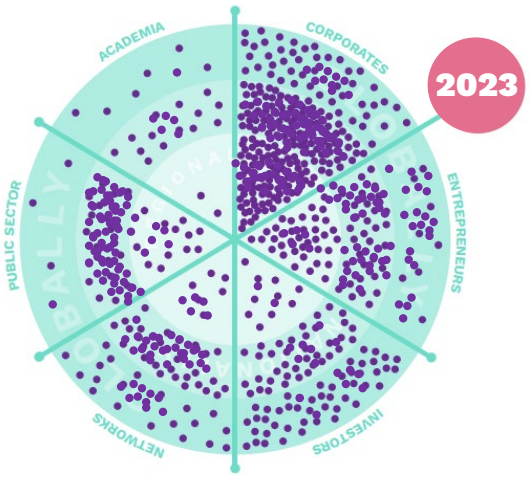
Executive Summary

DigitalWell Arena (DWA) is a Vinnväxt initiative that began its 10-year journey in 2019 as one of three initiatives that were selected from a call that targeted system-level renewal and sustainable growth, using the UN Sustainable Development Goals as a driver for collective action. This generation of Vinnväxt winners was among a wave of new policy interventions focused on leveraging innovation to address societal challenges – not only developing new products and services and strengthening capacity for innovation, but also putting innovation into action and strengthening societal functions in socio-technical systems for impact.

From the outset, DWA built on several regional strengths: a successful cluster of ICT companies (Compare) with a well-functioning symbiosis with other industrial sectors in the region, research expertise (in service design, service innovation and data security) with a tradition of integrating the demand perspective (i.e. the use of technology to address societal needs), as well as actively engaged public-sector organisations and a strong regional leadership (with a long history of support to collaborative initiatives between actor groups). These core strengths would be leveraged towards realising DWA's strategic vision of establishing an effective, regional innovation system for data-driven innovation of digital welfare services.

Among Vinnväxt initiatives, DWA is unique in its focus on innovation that "comes to market" through public sector services. This was accompanied by the need to mobilise different types of actors and address different dimensions of system change. The key actor groups in focus were public sector organisations (municipalities and regions with challenges that can be addressed by digital solutions) and companies (who can develop solutions to address these needs). In addition to working to accelerate the development of new products and services (fostering entrepreneurship, investment and growth) to address public sector needs, DWA worked with developing public sector innovation capacity and adapting broader system-level frames (including new processes for assessing quality in health apps and public procurement). Thus, in addition to public sector organisations (as challenge "owners"), companies, investors and digital infrastructure actors (as "solution providers"), DWA engaged with public sector actors with responsibilities for quality/regulation, public procurement and other institutional frames.

The composition of actors and the portfolio of actions undertaken in DigitalWell Arena's first five years provide indications of the substantial steps that have already been achieved. DWA has expanded its collaborative base from 17 regional partners to a collaborative arena has in 2024 comprised of over 800 entrepreneurs and larger companies, investors, academia and public sector organisations from Värmland, elsewhere in Sweden and internationally.



This collaborative engine has succeeded in setting up and spinning-off new innovation support infrastructures (DigitalWell Ventures[1] and DigitalWell Incubator[2]), new models and community for developing and procuring public service solutions (Demand Acceleration[3]), gathering authorities and experts to provide new inputs on policies for quality assessment of health apps, and evolving capacity, behaviours and partnerships (through e.g. Innovation Commons, DWA innovation council, network of digital health innovation leaders in the public sector, etc.).

These successful steps have been a result of many contributing factors including strong regional anchoring and operational leadership capacities, the desire, commitment and enabling conditions to work together and leverage expertise from beyond Värmland, and the approach of actively experimenting with the issues – agile iteration and co-creating new solutions in collaboration with others.

Reflecting on the journey so far highlights key lessons and principles to inform the future:

- Build the community and collective change through "action leadership" and co-creation
- Work right to left, with attention to the demand side
- Learn by engaging, experimenting and scaling
- Where inappropriate to scale, refocus efforts on other change levers where can add value
- Develop sustainable operations that create value

Going forward, DigitalWell Arena will build on the successful steps, the expanded community and the lessons from "the first half" – leveraging a strong regional base with complementary expertise in other geographies, in order to; develop and scale actions that support the fruitful interaction between entrepreneurs and the public sector, the development of better digital solutions for health and welfare.

[1] an accelerator for digital health tech startups

[2] a member of the national incubator program with expertise in supporting entrepreneurs with digital products or services aimed at the public sector, with a focus on health and welfare

[3] See https://digitalwellarena.se/en/digitalwell-demand-accelerator/

Introduction

DigitalWell Arena is one of three initiatives selected in the latest generation of Vinnova's Vinnväxt program. The Vinnväxt program is a competitive call to promote sustainable growth in Swedish regions. With long-term funding, regions must be able to mobilise business, academia and the public sector in collaborative efforts to develop and commercialise new knowledge and technology.

Since its launch in 2001, the Vinnväxt program has developed an increasing focus on the innovation environments' contribution to restructuring and renewal, with the 2030 Agenda and the sustainable development goals as a guiding framework for transformation (Kontigo 2016; Vinnova 2018). This is reflected in an evolution of the program description and call texts (Vinnova 2001, 2002, 2005, 2013, 2018), as well as evolving monitoring and evaluation practices (see Table 1 and Appendix I).

Box 1: Introduction to the Vinnväxt program

The Vinnväxt program is run by Sweden's Innovation Agency Vinnova and was initially launched in 2001. Since then, it has promoted sustainable growth in Swedish regions by bringing together triple helix actors in long-term, collaborative initiatives designed to contribute to the development of internationally competitive regional innovation environments in specific growth areas. The program provides funding (in the range of 2-8 MSEK per year) and other support services over a period of 10 years. This can be used for institutional development and needs-driven R&D to strengthen cutting-edge competences in the various innovation environments.

Table 1: Evolution of Vinnväxt program

	From start (2001)	To latest call (2019)
Program objectives	Sustainable growth and more effective and attractive regional innovation systems	Renewal and contributing to social and environmental (in addition to economic) objectives, with SDGs as the driver for collective action
Selection criteria		
• strategic direction	• strategic development and improved international attractiveness for "existing areas of strength"	• long-term strategies for renewal, transformation and resilience through the capacity for continual system-level change
• role of initiative's leadership	• providing a strategic direction and facilitating linkages within the initiative	• mobilizing resources and creating increased leverage through connections with other actors and initiatives in the system on regional,

		national and international levels and taking on the role of "catalyst" and "system integrator"
Program effect logic and expected results	Strengthened research and education, more effective interactive learning and increased collaborative action for company competitiveness	Effective regional and thematic innovation systems with the ability to interact for change and innovation, and equipped for future challenges (with the ability to contribute to Agenda 2030 goals)

The evolution of the Vinnväxt program matches a parallel evolution of innovation policy more generally – moving from a focus on addressing structural system failures necessary for developing more efficient and effective innovation-producing systems (2nd generation) to one of addressing transformational system failures[4] necessary for solving complex societal challenges and transforming systems of innovation, production and consumption (3rd generation) – see Appendix II.

The main shifts can be summarised in terms of changes to, or rather a broadening of:

- **Directionality and strategic aims**
  not only more effective and attractive regional systems of innovation, but also transforming systems and addressing complex societal challenges
- **Leadership/institutional structures and ways of working**
  not only facilitating linkages within the (regional) initiative but also acting as a "system integrator" that engages other actors (nationally and internationally) in agile development processes (encouraging experimentation and learning/reflexivity)
- **Expected results of the collaborative action**
  not only support to innovative firms (and the launch of new products and services) but also support to understanding demand and enabling update of innovations on the market (and other aspects of transformative system change)

In both the third generation of innovation policy (generally) and the Vinnväxt program (specifically), we see a "zoomed-out" strategic direction and focus on societal/system-level transformation (vs. a narrower geographic or sectoral/thematic perspective of development efforts), as well as a more pronounced importance placed on engaging with the demand side to understand challenges and co-produce with users.

It is within this context that the Vinnväxt initiative DigitalWell Arena (DWA) emerged. In its application to the Vinnväxt program, DWA highlights its strategic vision of establishing an effective, regional innovation system for data-driven innovation of digital welfare services and points out a number of the key building blocks from which the initiative was established (see Box 2). In addition to research strengths (in service design, service innovation and data security) and a successful ICT sector/cluster (Compare) with a well-

[4] Including a lack of shared vision and directionalilty of the transformation process; insufficient spaces for anticipating and learning about user needs/demand to enable uptake of innovation by users/market; lack of multi-level policy coordination across different systemic levels; and insufficient ability of the system to monitor, anticipate and involve actors in processes of self-governance

functioning symbiosis with other industrial sectors in the region, the initiative drew on active and engaged public-sector organisations and a strong regional leadership[5].

Whereas most other (earlier generations) of Vinnväxt initiatives focused on innovation and renewal in an industrial sector, DigitalWell Arena framed its strategic direction in relation to societal challenges in health and focused on innovation and renewal of public welfare services (i.e. the public sector), through use of digital technologies and increased digitalisation of these services. With its anchoring in service design and service innovation, DWA took a user-driven and demand-side orientation from the outset. This put a stronger emphasis on the engagement of public sector organisations not only as funding partners, but also as "challenge owners" and potential "lead users" and markets for new digital innovations. This more active role of the public sector as a collaborator and co-developer influenced the specific leverage points in focus and the actions undertaken over time.

Box 2: Project summary in application to the Vinnväxt program (2018)

DigitalWell Arena is an ecosystem for user-driven innovation of digital health services, that enables growth. Through personalized, accessible and cost-effective solutions, we create health for everyone.

The public sector has seen the opportunities in digitalization; increase accessibility within the welfare - whilst delivering high quality and cost-effective solutions. Innovative services of tomorrow must therefore be designed based on actual user needs in real-world environments. To enable transformation, a long-term initiative is needed that brings together the public sector, ICT companies, research and users on a mutual platform.

DigitalWell Arena organizes and conducts R&D in health care as a service, and forms new structures to lead service innovation in the public sector. The strategy is based on making the public sector an active innovation driver, that creates increased growth in business. The central part of the strategy is to utilize the already **existing unique, cutting-edge knowledge in the Karlstad region; excellent research areas in service design, service innovation and data security** and combine this with a **renewed change management in the public sector**.

This opens up great opportunities for DigitalWell Arena to become a **leader in the development of digital health services**, both nationally and internationally, whilst combining high accessibility with quality and cost-effectiveness. **A long-term venture through Vinnväxt is expected to establish an effective, regional innovation system for data-driven innovation of digital welfare services**, where business actors, public sector, academia and civil society organizations have developed a good ability to interact for conversion and innovation.

In its second year, DigitalWell Arena identified key barriers to system transformation and formulated four overall change paths ("förflyttningsområden" in Swedish) and specific leverage points to address.

Building innovation capacity through collaboration

A core of all Vinnväxt initiatives is building linkages, innovation capacity and collaborative

[5] Region Värmland has a long history of support to collaborative initiatives and the development of a well-functioning innovation ecosystem. Efforts stretch from the vision of a service factory for societal development (SUNRISE) in 2003, to the region's launch of its most recent research and innovation strategy for smart specialisation (2022-2028).

action across disciplines, organisations and actor groups…within the regional geography as well as nationally and internationally. For DigitalWell Arena, focus has been placed on developing transdisciplinary collaboration among researchers, engaging with the public sector, and fostering new linkages between firms and the public sector. DWA has also focused on developing collaboration with other (policy/regulatory) actors nationally and internationally, in order to pave the way for development and uptake of digital health services.

Enabling the participation of the individual
The use of data and digital technology enables individuals the possibility to influence their own health. DigitalWell Arena has focused on developing and offering tools or processes that enable public health and care services (as well as other public service environments, such as schools) to co-develop and test such digital services in real-life environments, together with the individual. This has involved working more actively with building innovation capacity/behaviours in the public sector (including clarifying demand/needs, involving the public sector more actively in research activities, and working with public procurement as a tool to enable introduction and scaling of digital health innovation).

Fostering use of data and digital technology
A complementary path to enable the introduction and scaling of digital health innovations is the assurance of quality and secure handling of data. For DigitalWell Arena, this has included working to build/test new digital infrastructure (ex through research), testing an new digital services, as well as stimulating the use of standards/regulations and processes to enable collection, analysis and sharing/inter-operability and use of health data in a secure manner.

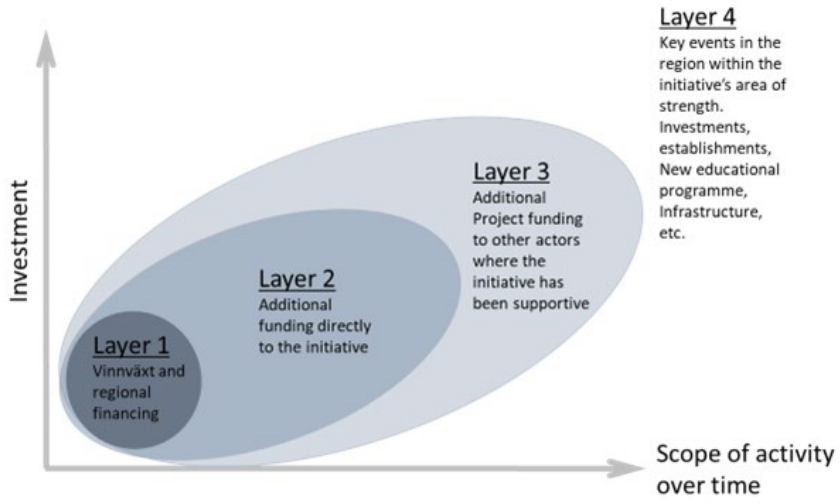
Strengthening service development and commercialisation
The fourth change path has been the strengthening and acceleration of entrepreneurship, service development, commercialisation and scaling of innovative ideas or services within the innovation ecosystem. While this may be a typical activity for innovation ecosystems, the unique aspect for DigitalWell Arena has been the focus on supporting companies to develop digital services that address public sector regulations and demand (with the public sector as a development partner), and that can be launched and scaled in public sector service markets, as well as to private actors working with health.

These four paths for transformation form the frame for the story of DigitalWell Arena's change journey (so far).

DigitalWell Arenas journey - so far

As part of the Vinnväxt program, DigitalWell Arena submits annual reports summarising results in terms of contributions to innovation and contributions to system-level effects, using the 'layer model' – a conceptual model (see Figure 1) to illustrate different layers of effects that are catalysed by Vinnväxt initiatives.

Figure 1: Vinnväxt layer model tracking system-level effects



The layers build on each other, such that Layer 1 (which represents the core Vinnväxt funding from Vinnova and regional actors) is leveraged to initiate new collaborative activities and mobilize additional project funding, either directly to the Vinnväxt initiative (Layer 2), or to other actors supported by the initiative (Layer 3). Layer 4 is a listing of key events and system-level developments (e.g. new establishments or investments, research or innovation support infrastructures, strategic partnerships, etc.) that can be linked to the financial and human resources mobilized in the first three layers. As such, this 'layer model' provides a way of documenting the ripple effects to which the collaborative Vinnväxt initiatives contribute and capturing the development of the innovation ecosystem over time.

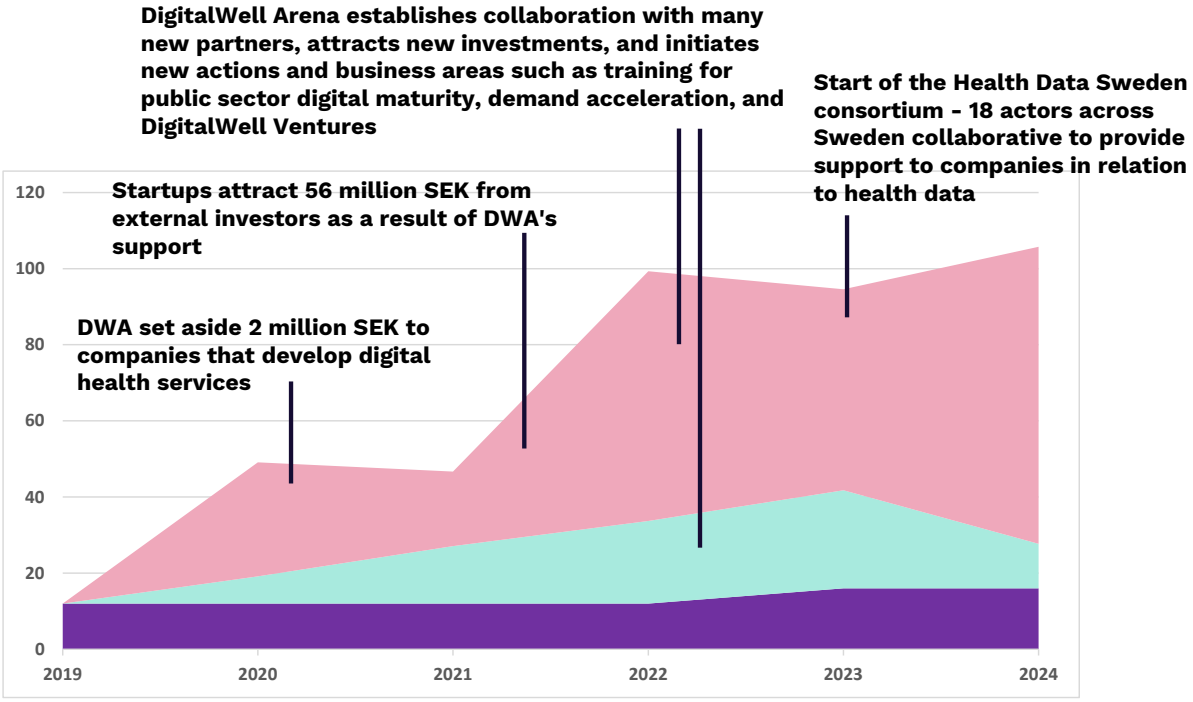
In the following pages, we use this framework to present the story of DWA's journey (so far) - first in terms of funding, then in terms of actor mobilisation, and finally in terms of the key milestones that actors were able to achieve during each year.

Mobilisation of funding

The strategic direction of DWA is achieved by mobilising actors to engage in (project) activities – funded by various sources (regional, national, EU). Total mobilised funding is an indicator of the scale of collaborative activity being conducted by various actors that is contributing to the overall aims. DWA and its engaged stakeholders have leveraged core investments from Vinnova and regional financing (totalling 68 MSEK) to mobilise a total of 395 MSEK over the course of five years (see Figure 2).[6]

[6] This represents a leverage effect of 5,8 (with annual leverage between 4 – 8,2 times core investments).

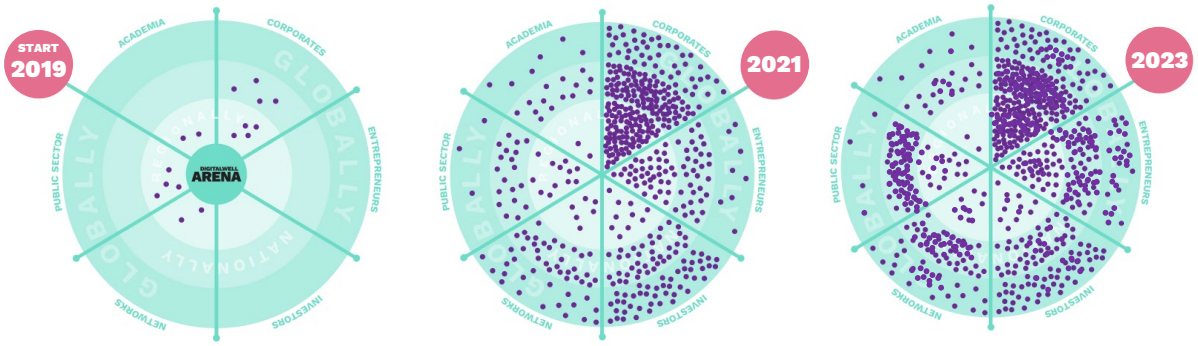
Figure 2: DWA Mobilised Funding (MSEK). Purpule = core investment from Vinnova. Green = attracted added funding for the coordinator. Pink = attracted added funding for other actors in the ecosystem as a result of DWA.



Mobilisation of actors

DigitalWell Arena has evolved over time from the initial partnership of 17 (mainly regional) organisations in 2019, to a broader set of actors (including an expanding group of startups and established companies) at the end of the first phase in 2021. By the end of 2023, DigitalWell Arena had mobilised a cumulative total of 800 entrepreneurs and larger companies, investors, academia network- and public sector organisations from Värmland, elsewhere in Sweden and internationally.

Figure 3: Development of the number of different actor groups over time: Public sector, academia, corporates, startups, investors, network organisations.



The growth of the different actor groups can be related to important activities and focus areas along the journey of DWA. For example the number of startups is a result of the early focus on supporting startups with knowledge in developing services for health, rather than the initiative developing services on its own. The broad international investor network has been attracted along with the development of accelerator DigitalWell Venture focusing on commercialisation. Public sector participation and collaboration is a result of focus on knowledge dissemination through educations to increase digital maturity, testing and procurement.

Highlights from the journey

The process of systems change occurs over time – as a series of experimental steps. Each year, the stakeholders engaged in DigitalWell Arena tested new actions and drew insights that informed next steps – scaling things that worked, changing focus away from things that didn't, and initiating new action areas (and partnerships) over time. A short summary of the story.

2019: DWAs first year was focused on engaging companies and researchers in innovation cases to address specific needs/challenges, using service design processes as the tool to enable user involvement. Engaging broader groups of companies in addressing specific needs in the cases was challenging, and the service design processes were time-consuming. The processes (and solutions developed) did not, in themselves, solve inherent system lock-ins and obstacles that existed in relation to increasing the use of data and digital technology in public sector health and care operations.

2020: Responding to the need for developing new approaches to support companies and the public sector (given the challenges of the pandemic), DWA initiated new collaborative groups, concepts and activity streams – including DigitalWell Ventures (a venture fund and cross-border accelerator supporting entrepreneurs develop and test to address public sector needs). Innovation support modules and the accelerator program enabled providing support to more companies/start-ups, enlarging this segment of DWA's community. While strengthening entrepreneurs' capacity in developing solutions geared to the public sector, these activities also highlighted the need to work with the demand side – finding ways to synchronise action between the actor groups and address broader system questions.

2021: Building from positive dynamics from initiated concepts and activities, 2021 was a year of expansion – with new partnerships (within and outside of the region), scaling of acceleration and incubation support to companies, and the experimentation with new support to acceleration of demand (and work with public procurement). The first collaborations with national and international actors brought visibility and recognition, involvement in new project consortia, and the ability to leverage DWA's expertise with others to initiate new activities. The expansion also highlighted the importance of building the ecosystem from a level playing field and enabling an arena for collective action – setting the scene for establishing new structures and principles of governance as DWA entered its second phase.

2022: Following a comprehensive strategy development process and input from the international interim evaluation of the first three years, the second half of 2022 marked the start of DWA's second phase in the Vinnväxt program – with new governance structures, clearer focus of scope, and expanded ambitions for all working areas. With various teams of stakeholders and an expanding project portfolio, it became increasingly clear that DWA couldn't "own", staff or lead all of the work areas being undertaken, and that it was necessary to consider how various action areas could sustain themselves and how DWA could create the enabling conditions (principles of governance, ways of mobilising actors, etc.) to ensure continued engagement in the efforts to realise the common direction over time.

2023: DWA's fifth year was marked by a period of strong expansion (with accelerated demand for demand acceleration), consolidation and re-organisation of the work areas, exacerbated by the new interpretation (and limitations in application) of state aid rules. Various activities (demand acceleration, quality assurance of digital health applications, and developing the mindset and methods for innovation commons) contributed to pave the way in understanding and addressing public sector demand. Taking on a broader understanding of health, these methods were tested in other public sector spheres (such as sustainability). In parallel, DWAs continued work toward common enablers that provide next steps in support to startups (through a spun-out DigitalWell Ventures). Increasingly, DWA works as an amplifier of actors' own initiatives – catalysing continued steps forward from experimentation and scaling of concepts and developing the ecosystem of actors. Common principles of collaborative governance and "action leadership" guide the journey ahead.

Figure 4: Selected results from DigitalWell Arena´s first five years, in numbers.

70

collaborative research and innovation projects implemented

75

published scientific articles

320

million SEK additional attracted capital to actors in the DigitalWell Arena environment

The detailed journal of key events and insights for each year is presented in the pages that follow.

The story - in detail

2019: Laying the groundwork

DWAs first year was focused on operationalising the aims of the application – testing different activities and approaches and finding the most appropriate path forward.

Key events

Building innovation capacity through collaboration
As with all Vinnväxt initiatives, the first year had a strong focus on setting up structures for governing the initiative (with the process leadership team and the steering group) and developing collaborative processes (e.g. innovation support modules for companies) and infrastructure (e.g. a physical co-creation space called the Innovation Hub).

Among core partner organisations, see a similar mobilization of collaborative power. At KAU, a new cross-disciplinary research group (with individuals from four institutions: data science, service design, health and social science, gender studies) begins to take shape – working together on cases (with companies) in public sector environments. Region Värmland establishes a new "Quality of Care" operational area.

Tools/processes to enable individuals and public services
In collaboration with relevant municipal and regional departments, initiated work to identify relevant innovation cases based on needs in the public sector. Large companies were involved in developing the method toolbox for uncovering challenges/needs in the public sector.

Began working with specific cases involving individuals (e.g. Att hitta rätt) using double-diamond service design processes. (Later changed approach to work with organisations.)

Data and digital technology (quality and security)
New cooperation initiated between Karlstad El & Stadsnät, Telia och KAU to develop digital infrastructure (5G testbädd).

Service development and commercialisation
First cases testing company prototypes in public sector care environments (e.g. "Att hitta rätt") are initiated – leveraging cross-disciplinary research teams from KAU.

Cross-disciplinary research conducted on specific services (e.g. a shower robot, sms-service for **health and care).**

Insights

- Individual actors have their own priorities and agendas. It is difficult to engage companies in innovation cases that address specific needs/challenges, where the purpose is not fully in line with their own strategy (and where it is not certain that the company will be a solution provider).
- The development of new services based on service design processes is time-consuming, and does not, by itself, solve the inherent system lock-ins and obstacles that exist in relation to increasing the use of data and digital technology in public sector health and care operations.
- However, the need for user involvement is crucial, and DWA needs to continue to experiment with other approaches to address this part of the DigitalWell Arena assignment.

2020: Not letting a crisis go to waste

Drawing from insights from first innovation cases and the need for developing new approaches to support companies and the public sector (given the challenges of the pandemic), DWA initiates several new collaborative groups, concepts, and activity streams.

Key events

Building innovation capacity through collaboration
Collaborative decision in the steering group to focus on three working areas: health arenas, acceleration, and transformation support. (Experienced difficulty in operationalising and progressing the transformation support and policy work.)

The establishment of the "Innovation council" (made up of individuals from Compare, KAU grants office, ALMI, Karlstad municipality and Region Värmland) with the mandate to make decisions on support services provided to entrepreneurs and companies (through innovation support modules).

Continued development of a cross-disciplinary research centre at KAU through working in concrete cases (together with companies and public sector health and care environments).

DWA develops a partnership with several other clusters and competence centres throughout Sweden and applies to be one of Sweden's Digital Innovation Hubs: Health Innovation of Sweden (HIOS).

Initial DWA partner Experio Labs (with expertise in service design methods) evolved as DWA learnings gave less focus on using/scaling up service design processes (rather on implementation/scaling). Expertise in using service design as a tool became an integral part of Samhällsnytta AB at KAU, and some of the local Experio Lab group later joined the work on sustainable development within Region Värmland's department for Regional Development.

Tools/processes to enable individuals and public services
Region Värmland gathers actors to develop the "health arena" concept – where public and private care providers open up their organisations for co-creation and test of new services.

In parallel, Karlstad municipality is selected by SKR as one of ten "model municipalities" with a focus on the development of digital technology within elderly care. With co-financing from SKR, the municipality invests in a number of development projects including "Stjärnhuset" (serving as one of the first "health arenas") and engaging more staff in the co-development work.

Initiated work within "project test" group (Region Värmland, Karlstad municipality and DWA process leadership) to develop concept and working practices for test of new digital services in public sector health and care operations.

Data and digital technology (quality and security)
The municipal company Karlstad El & Stadsnät launches digital infrastructure (service platform) that links/visualises data from multiple sources – enabling the development of new digital services at "Stjärnhuset".

Karlstad El & Stadsnät, Telia and KAU data science researchers develop and initiate 5G test environments that can enable test of new digital welfare services.

Service development and commercialisation
Further development of innovation support modules (and advisory services) provided to entrepreneurs and companies (based on KTH innovation readiness level steps) and launch of a call for 2 MSEK to support entrepreneurs and companies during the COVID crisis.

Representatives from DWA and collaboration partner Xplorico are accepted to Founder Institute's school for accelerators. The training led to the speedy initiation of DigitalWell Ventures – an independent venture fund (with an initial investment of 1,5 MSEK from Region Värmland) and unique cross-border (SE-NO) accelerator program that offers entrepreneurs advisory support and access to test in public sector health and care environments.

Insights

- Small, entrepreneurial startups have different needs (than bigger companies) in working with the public sector (to support digital health service solutions). Through development of innovation support modules, could provide tailored support to more companies/start-ups.
- The different actor groups (public sector, companies and academia) operate at different tempos and use different language. It is necessary to provide mechanisms that help synchronise (more rapid) action between the actor groups through structured, yet neutral and trustworthy forms. This sparked interactive activities like "Innovation forum" and "Field testing".
- Innovation and acceleration support modules for companies were initiated to help companies gear their development efforts towards public sector needs. While strengthening entrepreneurs' capacity in developing solutions, these activities also highlighted the need for active work with the demand side.

2021: Expanding arenas for experimentation

Building from positive dynamics from initiated concepts and activities, 2021 was a year of expansion – with new partnerships, scaling of acceleration and incubation support to companies, and the experimentation with new support to acceleration of demand.

Key events

Building innovation capacity through collaboration
Further work within “project test” group to develop working practices for test of new digital services in public sector health and care operations. The “Field test” process in Torsby is the subject of new research by Högskolan i Väst, and organisations in other regions (e.g. Kalmar and Uppsala) acknowledge DWA/Värmlands competence in this area (with presentations and the initiation of new experience exchanges).

Region Värmland leverages DWA as an innovation platform in several regional projects/initiatives. DWA is nominated to coordinate the priority area of “Digital Health Innovation” in the region’s new smart specialisation strategy (2022-2028).

In collaboration with Arvika municipality, DWA engaged in the development and implementation of two vocational trainings for “digital innovation leaders in the welfare sector”. Participants are mobilised from the whole of Sweden.

DigitalWell Ventures become members of SISP (Swedish Incubators and Science Parks) and establish cooperation with Founder’s Institute in Norway.

DWA continues to expand its collaboration nationally (with e.g. SKR, eHealth and Procurement agencies) and internationally (with e.g. Norway) through projects, participation in steering groups, etc.

A national consortium of 12 actors form “Health Innovation of Sweden” – a national digital innovation hub.

In connection with self-assessment of phase one and strategy for phase two: lots of focus discussion of progress, remaining “lock-ins”, need for a different approach to organising the collaborative work and renewed strategic direction for DWA.

Success in growing project portfolio (with several projects and increased levels of financing in different focus areas).

Tools/processes to enable individuals and public services
Process for “Field testing” further developed as a core offering to companies and the public sector with several operational cases in Karlstad, Arvika and Torsby municipalities and in Region Värmland. Through the process, companies develop and test digital services that can be scaled.

In Arvika, the “IoT in schools” project serves as another “health arena” – where sensors and health data are used to support and strengthen the work with preventative care for students.

Initiation of new collaborative project PREDEM (led by Karolinska Institute), on preventative dementia, provides investment and opportunities for testing digital health services in new real-life environments. Expands collaboration with research environments in other regions.

Demand Acceleration pilot project (between DWA, Karlstad municipality and Vinnova) is launched with the aim of developing a new strategy for driving innovation and scaling processes based on (public sector) demand. The pilot will also test new approaches to innovation procurement. Demand acceleration begins getting national and international attention.

New vocational education for digital competence lift “digital leaders in the welfare sector” training strengthens interactions between public sector employees and companies through use of innovation support “test in real environments”.

Data and digital technology (quality and security)
Karlstad El & Stadsnät, Telia and KAU data science researchers launch new 5G test platforms at KAU and DW Innovation Hub.

DWA initiates collaboration with N!P (Nordic interoperability project) and begins exploring possibilities related to quality assessment and accreditation of digital health applications. In connection with this, DWA establishes new contacts (including the Swedish eHealth Agency) and develops new activities in this area.

Service development and commercialisation
DigitalWell Ventures expands its startup accelerator services with e.g. international mentorship (involving 70 mentors from 18 countries in 4 continents), investor breakfast club and co-founder matching program. The accelerator attracts 16 companies to the program (9 from Sweden and 7 from other countries in the Nordic and Baltic region).

Värmland's regional development committee decides to invest an additional 6 MSEK in DW Ventures and states desire to gather the region's specialised accelerators under one umbrella.

Continued development of new innovation support modules (e.g. information security) for companies, and ability to disseminate innovation checks (through SISP national framework). Approach to innovation support modules is implemented with other regional sectors (starting with tourism).

Insights

- The importance of involvement in/collaboration with national (e.g. SISP, SKR) and international (N!P) actors and networks is significant – for recognition, involvement in new consortia, and ability to leverage own expertise with others expertise to initiate new activities.
- It is also critical to build the ecosystem from a level playing field and an enabling arena for action. Openness and transparency are important to create involvement and a sense of participatory 'ownership'.
- Common principles (e.g. interaction triggers insights and innovation require space for experimentation) help guide both DigitalWell Arena as an intermediator and the actors in the activities made.

2022: Entering phase two with expanded ambitions and "reaping what was sowed"

The second half of 2022 marked the beginning of Vinnväxt's second three-year phase – with new governance structures and expanded ambitions for all working areas. The various experimental activities and investments in phase one are now leading to new projects and other types of spin-offs.

Key events

Building innovation capacity through collaboration
External evaluators from four other clusters/innovation environments in Europe assess DWA's first three years and provide feedback on development areas – catalysing new ideas for governance and activities. Based on recommendations, a new steering group is formed – with members from both regional and national organisations.

DWA is mentioned in both Region Värmland's smart specialisation strategy (2022-2028) and public health strategic plan (2022-2030).

At KAU, the ARENA project is initiated – creating a center for collaborative research on digital health innovation, bringing together researchers from 6 departments in 3 faculties and 2 support departments.

Region Värmland decides on next phase of "Academy for Smart Specialisation", which includes an investment in research on digital health innovation (through project DHINO).

HIOS merges with another consortium (led by KTH) to form Health Data Sweden (HDS). HDS is approved as one of four European Digital Innovation Hubs in Sweden (the only focused on health).

An informal, national "impact by demand" network is gathered – engaging individuals in leading roles in national agencies, municipalities and regions to explore the role of the public sector in challenge/demand-driven innovation processes and methods for working with and addressing (and accelerating) public sector demand. (This was the first step of establishing a community for co-creating and spreading the demand acceleration methodology.)

DWA becomes active as deputy board member in SISP and deepens collaboration with other national and international partners through conference participation, project applications, etc.

Tools/processes to enable individuals and public services
Research from SAVE and VAVES projects results in a regulatory process innovation that receives national attention. SKR requests the initiation of a national pilot to test the data-driven model in 38 other municipalities.

National education for digital competence lift (Level Up) established, with 300 leaders in public sector participating. Existing "digital leaders in the welfare sector" training strengthens interactions between public sector employees and companies through use of innovation support "Field testing".

Method support for "Field testing" spreads (through company Habbie) to other public sector actors in Sweden.

Demand Acceleration pilot develops into a structured approach. Karlstad municipality first to test approach – completing an innovation procurement using the method.

Principles are defined for Demand acceleration, see box 3. Relevant for more areas.

Box 3: Principles of Demand Acceleration

1. Innovation is not limited by supply but by demand. **Public procurement can drive innovation and growth.**
2. **Innovation requires space for experimentation and learning.** Innovation also demand the ability to embace failures and learn incrementally.
3. **Success cannot be analysed into existence.** The innovation process should allow co-creation in multiple phases to reduce risk and uncertainty.
4. **Interaction triggers insights.** Requirements and solutions contribute to creating interaction and dialogue to enhance understanding during the process.
5. **Understand the value of scalability**…at every stage of the process from market analysis of the need to evaluating business potential and disseminating the service on the market.
6. **Intellectual assets belong to the supplier.** This also creates incentives for scaling up and developing the services.

Other municipalities (e.g. Helsingborg) and other application areas (e.g. climate adaptation) express interest in learning and applying the method. Presentations for multiple national and international audiences, expanded network (including WWF, Ignite Public, etc.) and initiation of new (two-year) project to explore expansion of demand acceleration approach (applied to climate adaptation).

Data and digital technology (quality and security)

Project ”IoT I skolan för var och en” results in an IoT platform and testbed for school in Arvika (enabling test and development of e.g. ventilation and study environment for students).

Initiation of KAU-led research project DRIVE (2022-2030) for development of 5G and 6G data infrastructure to enable quicker data transfer between sensors and data systems – supporting innovation in areas of digital health services, mobility services, etc.

DWA deepens collaboration with N!P and connects with ORCHA Health in the UK to evaluate Nordic Digital Evaluation Criteria (a digital health accreditation system).

Service development and commercialisation
DigitalWell Ventures continues to expand its service offering (with e.g. increased investor network, new international mentors and presence in Norwegian demo days) and is sold to Inova – the common umbrella for specialised accelerators in the region. DigitalWell incubator is selected in Vinnovas national program for excellent incubators.

Digital health application “Föda utan rädsla” (Birth by Heart) – initiated as an “in real life” case in previous years – is granted an innovation loan from ALMI.

First company completes a procurement contract with Karstad municipality after having participated in Demand Acceleration pilot.

Insights

- An innovation environment cannot own (or staff/lead) its own work areas for long term growth and sustainability. It is important to consider how the continuation of the initiative can be ensured – with spin-off of work areas that can sustain themselves. A shared open arena or platform (vs. a closed project consortia) with clear working areas and enabling conditions engagement in the efforts to realise the common direction over time.
- Individuals can be strengthened through new public sector services or ‘user-focused’ research. DWA doesn’t have to work directly with the individual to influence/improve their health.
- In order to have uptake of digital solutions and enable innovation in the public sector, need to work within the existing (regulated) frames for public sector markets (e.g. norms and standards, public procurement laws). There is an open “market for action” to improve the enabling conditions for innovation of public sector services.

2023: Experiencing growing pains

This year was marked by a period of expansion (with accelerated demand for demand acceleration), consolidation and re-organisation of the work areas, exacerbated by the new interpretation (and limitations in application) of state aid rules.

Key events

Building innovation capacity through collaboration
Compare and DWA organise a meeting under the heading “Impact by Demand” in Stockholm (in April) that gathers more than 60 people (including European Commission and Climate KIC) to discuss system innovation and the role of the public sector.

New interpretation of state-aid rules requires DWA (and other intermediaries of collaborative innovation initiatives) to re-structure its operations – more strictly dividing between commercial and non-commercial activities. By end-2023, DWA has a new structure for its work areas (to be tested in 2024), with plans to separate DWA operations from Compare by 2025.

Initiation of pilot project on innovation commons (with nationwide engagement in a joint reference group) – aiming to explore new ways to support and finance the development of and access to shared system assets (methods, processes, etc. to support innovation).

Tools/processes to enable individuals and public services
National spread of the demand acceleration methodology through a train-the-trainers network (30 individuals from 8 teams around Sweden), a documented handbook (with a creative commons license), and a rapidly growing (international) Demand Acceleration Community. Additional use cases of demand acceleration method in Karlstad, Hammarö and Helsingborg municipalities and in Region Värmland.

Continued presentations of demand acceleration in multiple national and international fora, and acknowledgement of the approach as a "best practice example of driving knowledge uptake and innovation in and by the public sector" by the EU Knowledge and Valorisation Platform.

700 individuals from public sector organisations around Sweden are affiliated to the "digital competence in public sector" network.

Data and digital technology (quality and security)
DWA continues to strengthen collaboration with Sweden's e-Health agency and other organisations in their work towards quality assurance of health applications. Activities include speaking at Vitalis, forming a new partnership of actors (developed from "Field testing") and securing project financing for additional development work in this area.

Initiation of Quality Assurance of Health apps project (with N!P, Swedish e-Health Authority, etc.) to work on quality assurance of health applications – becoming an important forum to gather actors across Sweden to make advances on common frameworks.

Smart and Safe (led by Compare and implemented by Karlstad municipality) becomes a case within a joint initiative of IoT Sweden and the Swedish Authority for Privacy Protection (IMY) to develop new methods for innovation and ethics in the use of IoT technology.

Karlstad municipality takes the initiative to start "Värmlands platform" – a network of municipal and regional public sector organisations to pilot alignment between digital standards and APIs/inter-operability protocols across operational departments and geographies.

Service development and commercialisation
First year in national incubator program with 7 companies in the initial cohort. The accelerator program (in DigitalWell Ventures) continues to develop – with support modules in English, increasing numbers of international companies in the program, and more international members in the investor network. By end-year, the incubator and accelerator programs merge into one organisation - DigitalWell Ventures.

Insights

- Various activities (demand acceleration, field testing and quality assurance of digital health applications, and developing the mindset and methods for innovation commons) are working to pave the way in understanding and addressing public sector demand and providing next steps in support to start-ups (now a spun-out work area).

- Activities to understand and address public sector demand in the area of health and welfare are applicable (and in demand) to foster innovation in other public sector service areas (such as sustainability, transport, etc.).
- DWA increasingly works as an amplifier of actors' own initiatives – catalyzing continued steps forward from experimentation to scaling of concepts and developing the ecosystem of actors.

Lessons from the journey

No long-term journey is undertaken without its hurdles and surprise successes. Over the course of the first five years, there were some things that were more challenging than expected, and other things that progressed better than expected. Lessons can be drawn from all steps along the way.

The more challenging steps

Refocusing efforts on other change levers and developing expertise through partnering with others

Initial expectations to work with data and digital technology as an embedded aspect of digital health services were challenged by several barriers (such as existing infrastructures and policies as well as entrenched behaviours) that required longer-term efforts to disrupt. Instead of being able to directly "push" new tech solutions, efforts were refocused on enabling secure handling of data and quality assurance of new solutions. Without strong expertise about these topics, it was necessary to team-up with others in e.g. Health Data Sweden and the Nordic quality assurance efforts.

Building openness to experimentation through proactive engagement and interaction over time

Similar challenges to innovating within existing systems and structures were experienced in working with regional healthcare. With a larger organisation and well-established existing practices, it was more difficult to initiate or scale experimental practices and potential solutions. In order to engage with regional government leadership, it has taken time to discuss and anchor ideas from multiple perspectives and parts of regional government.

The steps that led to leaps

DWA's support to accelerating companies' work with developing digital health services and accelerating the public sector's work with addressing their demands have been two work areas that have mobilised broad interest, engaged many stakeholders, and resulted in a fast-growing portfolio of follow-on actions or spin-offs.

Working right to left with attention to the demand side

Building on research expertise with service design and experience in working to address user-needs, challenges and demand-oriented processes, DWA had a natural starting point to work with this perspective. Over time, DWA developed the insight that service design methods to address individual user needs weren't the answer to everything and put more focus on understanding challenges and bottlenecks to system change more broadly – with public sector needs and challenges as the focus as this represented the demand-side (or market) for digital health services. This perspective influenced DWA's approach to acceleration and incubation support to companies (helping them more efficiently feed into and address public sector needs for digital technology and digital health applications) as well as DWA's work with demand acceleration and procurement, and quality assurance. And instead of focusing on a particular method or approach (leveraging service design expertise), DWA began developing and experimenting with other methods to support system change.

Learning by engaging, experimenting and scaling
Influenced by service design methodologies – where engaging in real-time, interactive approaches with continual assessments of what's working and what needs to be improved are the norm, DWA's working approach had a natural focus on experimenting and learning by doing. The team maintained an active presence with relevant organisations to detect and actively engage in emerging questions – suggesting and setting up new processes and soft infrastructure for supporting innovation, mobilising individuals from many organisations (public and private spheres) in real life experimentation, and iteratively taking steps forward to address identified challenges. The six principles of demand acceleration (Box 3) became principles for the overall work in the arena. This proactive working approach was complemented by individual and organisational trailblazers that had curiosity, drive and a mandate to try new things – and leading by example.

Building the community and collective change through "action leadership" and co-creation
A working approach that continuously included mobilising broader interest and stakeholder engagement has supported a strengthened national and international position – and a growing community of engaged stakeholders. Building on a strong and stable long-term backing from regional leadership (regional government and other organisations in the region), DWA has been able to dock into regional processes and build linkages with others – creating new teams for action and leveraging expertise for guidance and governance. These action teams (in e.g. innovation support and acceleration, quality assurance and test, demand acceleration) have continued to develop and engage in national and international processes, and the networks and critical mass for action continues to build. DWA provides an 'action leadership' and collaborative governance of the arena – facilitating processes of interaction, co-creation and spreading knowledge, capacities and solutions (vs. owning and having the sole mandate).

Developing sustainable operations that create value
DigitalWell Arena's over-arching aim is to identify and build supportive activities that help make it easier to take advantage of data and digital technology for health. The project funding that supports DWA's base as well as additional attracted funds contribute to identifying, testing and validating various "hypotheses for action". At the transition into phase 2, DWA process leadership set a number of baseline requirements for the various "action areas" (operational units) driven by DigitalWell Arena, with the aim of ensuring that DWA focuses on areas that are in demand and contribute to system transformation. Until now, two operational units have been spun off into their own company, i.e. the incubator and the accelerator units of DigitalWell Ventures.

Guidelines for establishing new operational units (action areas) within DigitalWell Arena:

- Has a long-term vision and strategic direction (or mission)
- Addresses a gap/barrier and contributes to system transformation
- Has the ability to deliver services and value to a defined target group
- Has their own budget with a self-sustaining funding model
- Has a defined team
- Connects partners and key competencies based on the needs and priorities of the action area
- Coordinates underlying projects and funding streams
- Responsible for reporting and follow-up of their own activities.

The road ahead

Catalysed by national developments related to interpretation of state aid rules during 2023, the Board of Compare highlighted the need to identify an alternative long term host organisation for DigitalWell Arena. The start of 2024 marked the initiation of an interim

organisational set-up as DWA explores various scenarios for the road ahead. Building on its existing community and lessons from the “first half”, the coming years of DWA will leverage a strong regional base in connection with complementary expertise and capacity to drive change with stakeholders in other geographies in Sweden and internationally. And DWA will continue to scale operations that support the interaction between entrepreneurs and the public sector to support the development of public sector services (in health and welfare, and beyond).

Appendix I: Evolution of the Vinnväxt program 2001-2019[7]

Vinnväxt generation start date	2003 (Two-phased call open Jan – April and July – Dec '02)	2005/08 (Two-phased call open June – Oct '05 and Dec '05 – March '06; at end of '07, a third phase upgraded to "full Vinnväxt")	2013 (Call open Jan – May 2013)	2019 (Call open Oct '17 – July '18, with thematic seminars and dialogue to support regional mobilisation over the period)
Program Objectives (headline)	- Promote **sustainable growth** and **international competitiveness** based on high-quality **applied research and education** in future growth areas - Develop **effective** regional **innovation systems**	Building on the same overall program objectives (see left)… - Identify and support emerging areas of growth (filling out the Vinnväxt portfolio with growth initiatives at different stages of development)	Build and **develop innovation environments** in strategic areas of importance for **sustainable growth** in regions	- Create **sustainable growth** in regions by developing **internationally attractive innovation environments** in specific areas of strength - Sustainable Development Goals (**SDGs**) and gender equality perspectives should be embedded in the vision and working approach, as well as a **driving force for renewal and transformation**
(New) Characteristics	- Breaking new ground through a new type of call and funding approach; innovation systems in practice - Selection based on competition (challenging existing approach to regional policy) - Long-term (10-year) investment (regional and national actors together) - Triple Helix leadership and collaboration (strong involvement of politicians/civil servants unique) - Prioritisation and mobilisation of resources in functional regions	- After two calls focusing on existing regional strongholds, this call focused on "embryonic" or emerging regional areas of growth - Initiatives with high growth potential yet viewed as "risky investments" - Initiatives with a credible leadership, yet where stakeholder collaboration and development organisation are only partially in place (to be supported by expanded program services) - Taking on a portfolio approach (different "classes" of Vinnväxt initiatives)	- Focused on growth and renewal of an existing area of strength - Investing in mature innovation environments with an ambition for renewal/pursuit of new paths - Increased focus on green and social sustainability; challenge driven - Introduction of a flexible financing model; Vinnova financing should be used to create leverage - Positioning of Vinnväxt relative to other Vinnova programs; desire for linkages - Relating to Smart Specialisation - Contributing to Sweden being a leading, internationally attractive country for research and innovation - Increased focus on expectations for strategic learning and action research	- Agenda 2030 and SDGs used as the guiding light to catalyse renewal and transformation of the innovation environments - Strengthened focus on: * Agenda 2030 (holistic framework for sustainable growth) * Regional leadership/governance * Gender equality/inclusiveness * Connections with other innovation environments and programs * Internationalisation - Investment in the role of "system integrators" who guide and contribute to renewal and transformation - Increased focus on system impacts

[7] The Vinnväxt program has had a total of six calls (with different approaches) since 2002 – resulting in six "generations" of Vinnväxt initiatives (by year of initiatives' start date: 2003, 2004, 2006/08, 2013, 2016 and 2019). The table provides an overview of program objectives, key characteristics, selection criteria and expected results/effects from four of the six calls – illustrating the major shifts in the program's development over time. Data has been collected from call texts and interviews with (previous and current) members of the Vinnväxt program team.

Selection criteria	Credibility and relevance of: - Strategic idea - Potential for future growth (coupled to sustainable development) - Leveraging local/regional knowledge and initiative (geographic proximity and engagement of various actors) - Triple Helix governance and plan for implementation - Expected results and foreseen system effects	- Selection process in three steps (idea sketches; 2 yrs funding; ”upgrade” to full Vinnväxt) First steps focused on: - The strategic idea and its growth potential; future markets - Prerequisites for and ability to create new research-based knowledge and technology - Nature and degree of renewal - The people who are leading the initiative and the roles they have - Description of the geographic core (what assets in the functional region) - Development plan and potential barriers In the third step, initiatives were evaluated on the potential to develop into full-scale Vinnväxt (based on existing criteria)	**Potential** - Current position and potential for renewal and growth (including expected results) - How strategic idea leverages sustainable development and gender equality - Contribution to sustainable development and societal challenges, and to more effective innovation system **Actor Constellation** - Composition: breadth (TH+), relevance and engagement of key actors - Anchoring/mandate, competence and experience to drive initiative - Regional leadership; capacity to mobilise resources (regl and natl) **Implementation Feasibility** - Description of existing resources/system - Strategy for renewal - Degree of natl and intl connections - Leadership and organisation/governance - Implementation and financing plan - Strategy for learning/development	**Potential** - Through renewal and transformation, potential to contribute to Agenda 2030 - Contribution to: more effective innovation system, increased gender equality, stronger national and international linkages - Maturity of and collaboration between existing research and industry base **Actor Constellation** - Relevance of constellation for targeted area; legitimacy to drive initiative - Regional leadership and relation to other actors in innovation support system - Composition, competence and experience of initiative’s “process leadership” team - Gender balance **Implementation Feasibility** - Credibility of vision, strategy and action plan, as well as budget and financing plan - Leadership and organisation/governance - Plan for further development of system - Position relative to other initiatives/actors - Strategy for internationalisation - Integration of gender equality aspects - Strategy for learning/development
Effect Logic/ Expected Results	(From initial program document, Vinnova 2001) - Strengthened research and education within the growth area - More effective interactive learning (between different organisations and competence areas) - Increased collaboration around a shared vision to realise industrial renewal - Attraction of new companies to the region, new RDI actors/activities within the area - Building/strengthening of national and international linkages (of the ‘hub’)	After first 2 years: Strategic collaboration between research, industry and public sector actors has been established After 5-10 years: - Generation of new knowledge and new technology - Ability and experience to commercialise new knowledge and new technology - Creation of growth in companies and structures for internationalisation Longer-term: international competitiveness (for companies and the functional region)	Effect logic presented in the call **Expected results:** - New/increased R&D - Applied knowledge/commercialisation - New and increased resources attracted to the innovation environment **Long-term effects:** - Establishment of internationally attractive innovation environment - Development of companies' international competitiveness - Business actors and the public sector must have strengthened their ability to work with innovation processes and innovation - Secure the renewal and long-term growth prospects of stakeholders - Attractive environments to operate in for academia, business and the public sector as well as leading knowledge nodes in selected, strategically important areas	Effect logic visualised and presented in the call (including Agenda 2030 goals); applying initiatives submitted their own effect logic - Effective regional and thematic innovation systems where companies, the public sector, academia and civil society have developed a good ability to interact for change and innovation - The regional business community in the area of strength has increased its capacity for renewal and long-term growth - The regional R&D base within the area of strength has developed and has strong national and international connections - The public actors in the region have developed their ability to work with innovation processes

				- Contribution to Agenda 2030 goals 5,8,9,(10) and others dependent on thematic area of the initiative
Strategic Learning/ Monitoring and Evaluation activities	- Active Vinnväxt program officers (at Vinnova) - Active academic reference group/ action researchers attached to each initiative (coaching/intervention, reflection, systematic documentation) - Strategy for monitoring (annual reporting and strategic dialogue between initiative/region and Vinnova) and evaluation (external evaluation panel every 3rd year) to support continued strategic development	From 2008, new processes introduced: - More detailed annual reporting requirements including: web-survey, annual summary of development, income/expense statements, mapping/list of participating actors, and list of initiated projects - Increased focus on "system level changes in the regional innovation system" (e.g. changed stakeholder behaviors and priorities that can be traced to Vinnväxt initiative actions) – including a paper on "Vinnväxt action research" (Björn Eriksson 2010) In addition Vinnväxt wrote or commissioned studies to enhance strategic learning (on program level). "Vinnväxt I halvtid" (2010) and "Hundra år av erfarenhet" (2011) summarise results and learning, and suggest possible areas of development for the future.	- From 2012: Development of the "skiktmodell" (a model to capture system impacts – investments and dynamics) - From 2015: Vinnova summary of "strategic learning" and expectations for action researchers	From 2018: - Based on the program effect logic, applying initiatives were expected to submit their own effect logic which would guide their own strategic learning activities - Initiation of program level action research project focused on capturing system effects

Appendix II: Evolution of innovation policy[8]

	2nd generation: Systems of Innovation (1980s to today)	3rd generation: Transformative Change (emerging)
Rationale for policy intervention	Address structural system failures reflected in the lack of linkages, mutual learning and use of knowledge between different actors and actor groups	Address transformational system failures in directionality, policy coordination, demand articulation and reflexivity that are necessary elements for solving complex societal challenges
Underlying model of innovation	Interactive and system-bound: chain-linked model Innovation is fostered through regular interaction and feedback loops between actors (government, science and industry) in a geographically, sectoral or technologically defined 'system of innovation'	Systemic and experimental: quasi-evolutionary model Innovation if fostered through purposeful experimentation and feedback loops between invention, innovation and use, and ongoing interactions between actors, networks, institutions and technologies
Typical policy activities	Instruments that aim at developing linkages, interactive learning and coordination/alignment between actors in order to stimulate knowledge utilization, innovation and entrepreneurship, which in turn fosters competitiveness and economic growth	Instruments that seek to foster new connections between systems, providing "spaces for experimentation" and co-producing solutions that can be expanded to enable broader socio-technical system change (for example, through missions and challenge competitions or challenge-driven innovation programs)

[8] See Weber and Rohracher (2012), Schot and Steinmueller (2018) and TIPC (2019)

Towards a healthy life through digital health innovation
– DigitalWell Arena at half-time

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