

Initiating and Scaling Radical Innovations in Healthcare: Revisiting the Roles of Public Procurement and Transformative Innovation Policy in Sustainable Service Ecosystem Design

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Key words

Innovation policy; Public procurement; Demand and innovation; Concepts of demand-oriented policy; Public sector innovation

Introduction

Demand articulation failure – shortcomings in anticipating and learning about user needs – provide a rationale justifying transformative innovation policy (Weber and Rohrer, 2012). Innovation-enhancing public procurement (IEP), i.e. using public procurement to articulate unmet societal demands, and to foster the development, production, selection, diffusion, and use of new technologies to meet those demands, represents a powerful policy approach to address demand articulation failure (Chicot and Matt, 2018).

The potential contribution of IEP to transformative innovation can be limited by issues arising during selection phase of the innovation process, specifically the scaling of an innovative solution beyond an initial customer. In the absence of scalability, the initial customer carries all development and maintenance costs; the supplier has only one income source; and the societal value of the innovation is limited because value-in-use is captured by the initial customer. To mitigate these issues, sustainable business development and scalability must be integrated into the procurement process.

In practice, this is difficult because innovation and procurement operate on fundamentally different principles: procurement systematically evaluates solutions against predefined criteria and strict regulations, while innovation navigates the unknown. The predominant approach used by public organizations to integrate the two is by adapting innovation frameworks to fit within public procurement processes. Our experiences with these organizations suggest that this approach is limiting and does not adequately address scalability.

Here, we developed the proposition that by incorporating a venture logic into the procurement process, the reverse of predominant approach used by public organizations, the chances of uptake beyond the initial customer would be increased. Venture logic criteria serve as a model to evaluate whether a process effectively stimulates uptake. We developed the Demand Acceleration framework as an approach to achieve this. The Demand Acceleration framework offers a set of core values and guiding principles for public organizations engaged in IEP (Table 1).

Table 1 Demand Acceleration framework core values and guiding principles

Core values	Guiding principles
Innovation means embracing complexity and uncertainty - links to Effectuation - (Sarasvathy 2001)	Non-predictive control of the procurement process – navigating uncertainty requires non-predictive control processes designed for unpredictability
Innovation is not limited by supply but by demand - links to 3rd generation innovation policy – (Shot and Steinmuller 2018, Grillitsch et al 2019)	Iterative interaction-based procurement processes – needs, requirements, and solutions change as users and suppliers interact with innovations in its different shapes
Procurement has the potential to become an essential instrument in driving transformative change towards a sustainable society (links to Public Procurement as an innovation policy tool (Edler and Georghiou 2007, Edquist and Zabala-Iturrigagoitia 2012)	Innovation driven procurement, not procurement driven innovation – when integrating innovation and procurement, the process must follow innovation logic but also comply with the basic principles of public procurement
The 5 principles of public procurement (non-discrimination, equal treatment, proportionality, transparency and mutual recognition) are based on democratic values and sound business practices and should guide all interaction between public buyers and suppliers	Scalability beyond the first customer – scalability increases shared value for buyers, suppliers and society. Designing a sustainable business-development oriented innovation process is essential

Methodology

We used an action research case study (ARCS) approach to test our proposition. Developed by McManners (2016), this method combines the prescriptive case study process with an action-oriented approach to real-world problem solving, thereby providing both academic rigour and practical relevance. ARCS represents an approach to embed sustainability within policy through the integration of academic researchers and non-academic participants in the co-creation of new knowledge to achieve a common goal, and approaches such as ARCS are increasingly cited as a means of addressing complex societal challenges (OECD, 2020).

We applied the ARCS methodology within a single case study of ViroteaED, a VR-based education software developed in a collaboration between the Cognition Team of Karlstad Municipality and Silviasystrar specializing in dementia care. ViroteaED enables healthcare personnel within disability services and elderly care to experience everyday situations from the perspective of individuals with cognitive impairments (e.g. autism and dementia) through VR-based simulations, and thereby gain a deeper understanding of their challenges and needs. The collaborative and innovative process of developing ViroteaED can be considered a prime example of transformative innovation, as it directly addresses Karlstad Municipality's critical challenge of a shrinking healthcare workforce amidst increasing demand for support. By significantly enhancing care efficiency and promoting inclusivity, this development process aligns with the municipality's dual aims of tackling demographic challenges and empowering

and promoting the inclusion of all individuals regardless of socio-economic or demographic status. Moreover, the scalable design of ViroteaED, born out of this transformative process, makes it a powerful tool for driving systemic change in social and healthcare services, extending its impact beyond the municipality's own organization.

The ARCS approach sees the researcher acting as an objective participant, developing ideas to feed back to the subjects of the research and testing their validity within a robust research framework. In this work, the researchers performed a number of roles, including including co-leading and co-designing the process with Karlstad Municipality. One of the researchers was actively involved in co-leading and co-designing the development process, ensuring it was iteratively designed and continuously evaluated. Other researchers focused on data gathering and analysis, working closely with the team to integrate findings into the ongoing development process. As members of the working group, the researchers contributed to the iterative design, continuous evaluation, and systematic analysis, ensuring the robustness and relevance of the research outcomes.

The ARCS methodology as outlined by McManners (2016) consists of three phases:

- **Preparation** – Analysis of the context of interest, building a comprehensive and accurate picture of business-as-usual and developing a future vision including potential solutions to current issues.
- **Seeking ideas** – Development of a parallel perspective from a different sector to arm the action researcher with ideas to apply in the main empirical research.
- **Main empirical research** – Engaging with stakeholders, probing, testing and challenging views.

We applied this methodology as follows:

Preparation

The preparation phase was crucial for collecting information to determine if the application of Demand Acceleration to the development process, which eventually resulted in ViroteaED, was viable. Key risks explored included market demand uncertainty, organizational alignment, innovation climate deficit, and resource constraints.

Seeking ideas

The second phase of the case study consisted of three stages: articulating the need; anchoring the approach; and market analysis.

In Karlstad, the challenge in articulating the need was to enhance staff understanding of the daily experiences of individuals with cognitive impairments. The project aimed to integrate digital solutions into training programs to improve care quality. The process began with a dialogue to determine if Demand Acceleration was appropriate, followed by collaborative definition of the challenge.

Anchoring the need involved establishing readiness within the organization through workshops to address concerns and ensure a clear understanding of the core principles. The

approach was anchored through political and departmental support, making the challenge a priority.

Market analysis involved the issue of an RFI – Requestion For Information to gather insights from potential suppliers. This stage included innovative communication methods to reach a broader audience, ensuring diverse and creative solutions. Specifically, a dedicated website was created and linked to the formal RFI in the procurement database. The website featured a video produced by the Cognitive Team, vividly describing the experience of a person with dementia from their perspective. To maximize outreach, the website was promoted on social media platforms including LinkedIn, Instagram, and Facebook. Additionally, the information was disseminated through incubators across Sweden, and startups that were believed to have promising ideas were contacted directly. This comprehensive approach ensured a wide range of inputs, addressing an unmet social need with creative and diverse solutions.

Main empirical research

The main empirical research consisted of three stages: concept development; prototype development; and solution development.

Concept development included concept presentation, where suppliers developed and presented concepts addressing different types of cognitive impairments. This was followed by suppliers conducting market analysis to assess the potential demand and competitive landscape.

Prototype development began with the development of minimum viable products (MVP) by suppliers, featuring at least two scenarios for different cognitive impairments. Suppliers then documented interactions with at least two potential customers other than Karlstad within customer engagement summaries. Finally, suppliers used the Lean Canvas to develop detailed business models, market analyses, and financial plans.

In the final stage, the selected supplier developed an implementable solution in close collaboration with the municipality's cognitive team. The solution was then integrated into the municipality's training programs and operations. The process required suppliers to create Lean Canvas business models and conduct interviews with other potential clients, setting the stage for scaling. By executing the plans developed during this process, the supplier successfully expanded their operations. Having Karlstad as a reference client significantly bolstered their credibility and facilitated broader adoption of the solution nationwide. This structured approach not only fostered innovation but also ensured that the developed solutions could be effectively scaled to meet the needs of a wider audience.

Findings

The project concluded with the successful development of ViroteaED, and its uptake beyond the initial customer (the Karlstad Municipality Cognition Team) to 12 public organisations within the first year after implementation, and subsequently to a range of municipalities and educational institutions nationwide. Several key findings emerged:

The project concluded with the successful development of ViroteaED, which scaled from the initial customer (the Karlstad Municipality Cognition Team) to 12 public organizations within the first year, and subsequently to various municipalities and educational institutions nationwide. Several key findings and challenges emerged:

Designing the procurement process with an innovation mindset and emphasizing scalability through integrated venture logic was crucial. This approach included preparing for full-scale implementation from the start, rather than working with a pilot mindset. As a result, the solution achieved both implementation and nationwide scaling, demonstrating the effectiveness of the Demand Acceleration framework.

Early involvement of suppliers, instead of a traditional extensive needs analysis, led to deeper insights and a more dynamic understanding of needs. This collaborative strategy proved highly effective.

Effective risk management was vital. Small, manageable risks and clear communication of the option to halt the process if necessary facilitated innovation while ensuring stakeholder confidence.

The importance of cross-functional teams was paramount. This process was designed as an innovation process, not merely a procurement process. However, procurers were involved from the start to ensure that the innovation process aligned seamlessly with procurement legislation. This integration allowed for the co-creating public buyer to implement and use the solution effectively.

The public buyer's commitment to supplier success fostered a collaborative environment, building strong partnerships and enhancing market success for suppliers. This commitment was evident through continuous support and resource allocation. However, this process required significant time and effort from the public buyer, highlighting the need for dedicated resources.

The procurement process was particularly suited to startups, which are familiar with iterative product development. Larger consultancy firms, with business models based on billing per hour, found the process less appealing. Despite being open to all suppliers, startups were notably the most successful.

Preparing for full-scale implementation from the beginning, rather than conducting preliminary pilot studies, was efficient and effective in scaling the solution.

Challenges

The true co-creation process required substantial time and effort from the public buyer, necessitating dedicated resources and sustained commitment. Scaling the Demand Acceleration framework is a significant challenge. It is essential not to view this practical application as a rigid blueprint but rather as a flexible framework adaptable to different contexts. The framework should inspire tailored processes suitable for each specific situation. To support this adaptive approach, we have established the Demand Acceleration Community.

This peer learning community enables experienced and new participants to support each other, share insights, and collaboratively address challenges.

Limitations

This study is based on a single case, which may limit the generalizability of the findings. However, several other cases involving different public buyers in Sweden are currently in progress, both within healthcare and sustainability/circularity sectors. More findings from these processes will be included in the full article. Additionally, Karlstad Municipality continues to use the methodology in new processes, further validating its applicability.

Conclusion

In this paper, we tested the proposition that incorporation of a venture logic into the public procurement process could increase the chances of uptake beyond the initial customer, and thereby increase the potential of IEP for transformative innovation. Our novel Demand Acceleration framework was used to successfully scale uptake of an innovation in an area of unmet needs for patients with cognitive impairments. This approach facilitates the rethinking of traditional procurement methods and embraces a more flexible, iterative process that aligns with the dynamic nature of innovation.

Future research should explore additional methods to further integrate procurement and innovation for broader applications in various sectors. Ensuring the uptake of innovative solutions is vital for achieving their full impact, making it imperative to assess and refine procurement processes continually.

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