

## Using Society 5.0 as Lever for Strategic Innovation

*Mitigating grand challenges in local regions*

Nielsen, Christian; Brix, Jacob

*Creative Commons License*  
CC BY-NC-SA 4.0

*Publication date:*  
2023

*Document Version*  
Accepted author manuscript, peer reviewed version

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*

Nielsen, C., & Brix, J. (2023). *Using Society 5.0 as Lever for Strategic Innovation: Mitigating grand challenges in local regions*. Paper presented at R&D Management Conference 2023, Sevilla, Spain.

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

### Take down policy

If you believe that this document breaches copyright please contact us at [vbn@aub.aau.dk](mailto:vbn@aub.aau.dk) providing details, and we will remove access to the work immediately and investigate your claim.

# Using Society 5.0 as Lever for Strategic Innovation

## *Mitigating grand challenges in local regions*

Christian Nielsen & Jacob Brix\*  
Aalborg University Business School,  
Denmark.  
[\\*jbri@business.aau.dk](mailto:*jbri@business.aau.dk)

### **Abstract**

Society 5.0 is attracting attention as a new societal paradigm boasting a human-centric approach to innovation and development. The logic is that many decades of priority on technological innovation and less on social innovation have created grand challenges for societal, social, and ecological perspectives. This paper discusses how a city, a region, or a group of organisations can initiate and elaborate a collaboration built on the premises of Society 5.0, and what would be important for them to consider regarding the collaboration. We utilise inter-organisational and multi-level learning theories as theoretical backgrounds, specifically, the 4i and 5i frameworks. Our discussion adds a new level of learning to the existing literature: ‘extra-organisational learning’ based on a sub-process of ‘inspiring’, implying that Society 5.0 would require a 6i framework to achieve its full value creation potential.

### **Keywords:**

Strategic Innovation; Organizational Learning; 4i Framework; Inter-Organizational Learning; Multi-Level Models; Society 5.0; Grand Challenges

### **Cite as:**

Nielsen, C. and Brix, J. (2023). ‘Using Society 5.0 as Lever for Strategic Innovation: Mitigating grand challenges in local regions’, *R&D Management Conference*, Seville, Spain, June 17-21.

## 1. INTRODUCTION

Society 5.0 is a policy movement envisioned as a proactive response to the grand challenges we are currently facing. It is "(...) *a human-centred society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space.*" (Japan Cabinet Office, 2016). At its core, Society 5.0 aims to balance out economic development and solve social issues in society by emphasising a change of mindset from 'only' having a capitalist line of thought towards also an inclusive, socially responsible and ecosystem line of thought (e.g., Huang et al., 2022). With its focus on exploring and exploiting the integration of the physical space and cyberspace, "(...) *advanced IT technologies, Internet of Things, robots, artificial intelligence and augmented reality are actively used in everyday life, industry, healthcare and other spheres of activity, not primarily for economic advantage but for the benefit and convenience of each citizen.*" (Breque et al., 2021, p.9). We are witnessing a paradigm shift in how societal development is anticipated in the coming years, and we already see some contours drawn in this direction. Our logic is that some organisations have already started this transition by adopting, e.g., the ten principles of the UN Global Compact<sup>1</sup> and the 17 UN Sustainable Development Goals<sup>2</sup> in their strategies and ways of working. We also see policy tendencies pointing in this direction – the European Commission published a policy brief in 2021 on Industry 5.0 that is very similar to Society 5.0 (Breque et al., 2021). New reporting legislation will affect all European SMEs from 2023, requiring them to report their CSR impacts based on their business models and strategies (European Commission, 2022). A reflection is, therefore, whether established organisations can opt out of including the Society 5.0 vision (or parts of the human-centric approach) in their strategies in the long run if they want to remain continuously relevant (Huber, 2004; Nielsen & Brix, 2023).

Embarking explicitly on the Society 5.0 journey is not a job for – or the responsibility of – a single organisation: one organisation cannot succeed in the vision of Society 5.0 alone. The premise for realising this paradigm-shifting vision is *collaboration* across organisational and sectoral boundaries (Carayannis & Morawska-Jancelewicz, 2022; Klitgaard, 2023) and those different organisations buy-in on the new paradigm when renewing their strategies (Brix & Nielsen, 2023). The Society 5.0 agenda challenges our organisational and management theories as these are typically created, tested,

---

<sup>1</sup> <https://unglobalcompact.org/what-is-gc/mission/principles>

<sup>2</sup> <https://sdgs.un.org/goals>

and elaborated within one sector (e.g., Colquit and Zapata-Phelan, 2007). Therefore, the definitions and the outcome logics also differ, e.g., if we talk about strategic innovation from the standpoint of either a public organisation or a private company. From a private sector perspective, examples of strategic innovation could be the creation of new markets, commercialisation of new technology or business model innovation (e.g., O'Connor et al., 2018; Taran et al., 2021), and from a public and third sector perspective, examples of strategic innovation could be new partnerships with organisations from other sectors, and the introduction of co-production of public services that traditionally have been defined top-down (Bovaird et al., 2019; Brix et al., 2021; McMullin, 2022). In this paper, we rely on a theory of organisational learning and inter-organizational learning since this stream of literature argues that strategic management (and strategic innovation) is about striking a balance between *exploration* and *exploitation* (March 1991; Huber, 2004; Brix, 2019), which represents a logic that already is used by organisations from all sectors (Choi & Chandler, 2015; Anand et al., 2019; Anand & Brix, 2022).

We see an exciting potential for larger cities and municipal regions to respond 'bottom-up' to the new paradigm. Our logic is that a joint innovation strategy that takes the point of departure in the Society 5.0 agenda would have to be defined among organisational stakeholders in a local region that includes a shared vision that can unite public, private and third-sector organisations and their strategic actions of balancing between exploration and exploitation towards realising the social, societal challenges they are experiencing as local communities.

In this conceptual paper, we discuss the following question to help realise the promises made by the Society 5.0 paradigm: *How can a city, a region, or a group of organisations initiate and elaborate a collaboration that is built on the premises of Society 5.0, and what would be vital for them to consider regarding the collaboration?* The purpose is to understand better how the transition from the current society level towards Society 5.0 can be supported by providing reflections on and advice to Society 5.0 as an emerging field of research. Our paper aims to initiate a dialogue in the research community on how we, as scholars, can help and advise practitioners in this critical transition.

In the following, we start by explaining what Society 5.0 is. Then we introduce and unfold the theoretical background of inter-organizational learning. Finally, we discuss and conclude the study.

## 2. EXPLAINING SOCIETY 5.0

### 2.1 The evolution from Society 1.0 onwards

What characterises the development from one societal stage to the next is that the new stage seeks to solve the problems created by the 'old model' (Huang et al., 2022). Several thousand years ago, the development went from the hunter-gatherer society (Society 1.0) to the agricultural society (Society 2.0) because there was no longer enough food for increasing population numbers and because new knowledge and simple technology made it possible to move forward. In the later stages of Society 2.0, investments started to build critical infrastructure that could be used to move goods over longer distances. The transition to the industrial society (Society 3.0) occurred as new knowledge accumulated and new, more advanced technology emerged. At the beginning of Society 3.0, workers were regarded as machines without rights, and when the development of automation accelerated, we started talking about working hours, labour rights, etc. Around 50 years ago, we saw the transition to an information society (Society 4.0) (Huang et al., 2022). Society 4.0 is characterised by, e.g., mass consumption of scarce resources, profit maximisation, efficiency and standardisations of production etc., which has created a range of problems – or grand challenges<sup>3</sup> – that we are currently trying to grasp and respond to while defining and travelling towards Society 5.0 as a new paradigm.

### 2.2 Society 5.0

Society 5.0 is – as a reminder – defined as "(...) *a human-centred society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space.*" (Japan Cabinet Office, 2016). Society 5.0 assumes that all development must be human-centred (Huang et al., 2022). New digital technology and platforms such as the metaverse – “a seamless connection between people's physical and digital lives” – will play a significant role in future societal development (Rosenstand et al., 2023). The interesting shift in the new policies is that social innovation is equated with technological innovation (Gershenfeld et al., 2017). The latter has so far had the status of 'golden standard' and 'highest carat' in national and international policies. However, human-centred development does not mean that technology must necessarily be attributed a lower value: “*Industry is an integral part of society. The revolution of the industry will push the development of society. Also, the transformation of society will promote the next industrial revolution.*” (Huang et al., 2022, p.427).

---

<sup>3</sup> E.g., defined by the UN SDGs such as 'Affordable and clean energy' (SDG7) and 'sustainable cities and communities' (SDG 11)

In Society 5.0, a prioritised integration of cyberspace and physical space is explicitly considered, as this is believed to bring great potential value for the public in this integration (Brix & Nielsen, 2023; Rosenstand et al., 2023). However, the approach to development is turned on its head: in Society 5.0, the logic is that critical actors at international, national, regional and local levels must start by finding common visions that matter to them and then examine how technology, economy and experts can be used and mobilised to create the desired changes (Japan Cabinet Office, 2016).

### **2.2.1 The Society 5.0 Agenda**

The logic is that society, in general, has not managed to utilise all the technology that has already been developed; there is a gap between technological development and social development, and we see the consequence of having used more resources in our production than the planet has been able to regenerate (Gershenfeld et al., 2017). In short: the Society 5.0 agenda is to create a resilient, sustainable, and human-centred development with a focus on the well-being of all people, regardless of whether they are citizens, users, customers, employees or managers. The premise for success is that a framework must be created for a 'system of systems' across sectoral boundaries, cyberspace, and the physical world to be resolved, and where loosely coupled partnerships collaborate to resolve large and small (societal) problems. Boemenburg and Gassmann (2022) provide a less abstract and exciting connection to the societal development trends denoted by the Society 5.0 movement. The underlying mechanisms in a Society 5.0 perspective rest on a Penta-Helix mindset where human and artificial intelligence enrich one another, and stakeholders collaborate across traditional boundaries. According to Huang et al. (2022), the characteristics of a Society 5.0 are, among others:

- Innovation often occurs across sectors and disciplines and can be transferred from one area to another.
- Initiatives are open and collaborative and constantly include a wide range of actors.
- Ideas and implementation are often bottom-up processes, although usually with support from the public system or companies and characterised by co-production.
- Innovation often creates formal communities of interest, such as associations and organisations.
- Innovation focuses on discovering, using, and coordinating the mobilisation of both physical and human resources.
- Innovation often results in new partnerships (among public actors, companies, associations, individual citizens, etc.) or new distribution roles in existing partnerships.

As such, the mindset here is akin to collaborative thinking regarding ecosystems, and the requirements for collaborative learning and value creation are eminent (Es-Sajjade, 2021). Therefore,

doing business and competing based on collaborative ecosystems is expected to be increasingly applied. The barriers associated with these new ways of collaboration and working are highlighted by Nagasato et al. (2018) as 'walls' that need to be broken down. These are the walls of 1) social acceptance, 2) human resources, 3) technologies, 4) the legal system, and 5) ministries and agencies.

Our logic is that Society 5.0 can serve as a lever for strategic innovation in a local context where various organisational actors from different sectors can collaborate to start realising the promises made by the Society 5.0 vision. This is, however, not problem-free since many dilemmas and paradoxes will arise (Schmitt et al., 2018). At the firm level, the transition, e.g., to more or new digitalisation, requires executives *"to look carefully at all aspects of their operations, and in many cases to embark on an integrative programme of digital transformation (...) which involves re-examining the cognitive dimension of the business model (how managers seek to create and capture value), the routines, and the operating model (how internal activities are structured and managed)."* (Volberda et al., 2021, p.3). In this article, we are particularly interested in the style of collaboration required to realise the Society 5.0 vision, and hence the need for both organisational – and inter-organizational learning to take place. In the definition by the Japanese Cabinet Office (2016), the premise is that the balance is created by *"(...) a system that highly integrates cyberspace and physical space."* In the following, we will elaborate on how such a 'system' can be understood, built, and elaborated from a theoretical perspective.

### **3. THEORETICAL BACKGROUND**

We apply theories of organisational – and inter-organizational learning (Larsson et al., 1998; Holmqvist, 2004; Brix, 2021) to frame a discussion for how a collaborative context can be initiated and elaborated with the point of departure in the Society 5.0 vision. The proposed logic is that understanding the value creation co-produced across organisational and sectoral boundaries is imperative and that Society 5.0 introduces new dimensions of connectedness, a term applied by Gassmann and Ferrandina (2021). Society 5.0 introduces new types of connections, for example, using advanced technologies to enhance value for citizens by creating efficiencies and new business models through digitalisation and data. In addition, Society 5.0 introduces the merging of the natural world with the metaverse through new technologies (Rosenstand et al., 2023). Applying a systems perspective looking at the collaborative processes and the value added to all stakeholders, enables us to provide tentative advice on the preliminary "dos and don'ts" in the remainder of the paper.

### 3.1 Inter-Organizational Learning: Definition and Key Components

Inter-organizational learning is defined by Larsson et al. (1998, p.289) as something that can be “*achieved by transferring existing knowledge from one organisation [to another organisation], as well as by creating completely new knowledge through interacting among organisations.*” As stated before, we argue that the theory of inter-organizational learning (and organisational learning) represents a relevant framing for this paper since the exploration-exploitation division applies to understanding strategic renewal in all organisations. In addition, this literature is well-developed in explaining 1) the nestedness of learning, 2) the ‘together-we-stand-stronger’ argument, and 3) the processes of creating new knowledge and putting it into play.

The *first* explains how learning takes place at different levels ranging from the individual to the group/team, to the organisational and inter-organizational, and back again (Crossan et al., 1999; 2011; Holmqvist, 2003; Jones & MacPherson, 2006; van Winkelen, 2010; Brix, 2017; 2021). The *second* logic is that the theory of inter-organizational learning emphasises that organisations in collaboration can create better results together than if they were not collaborating with other actors (Larsson et al., 1998; Jones & MacPherson, 2006; Anand et al., 2021). The *third* logic is that the processes of working with knowledge and its links to learning are well established and help explain how knowledge creation, retention and transfer can be performed (Argote, 2011; Brix et al., 2021).

A premise for inter-organizational learning is that collaborating organisations have to focus on the dual processing of learning (the two-level game) that takes place at different paces: 1) new collaborators have to learn to collaborate before they 2) can achieve performance-improving outcomes of their collaboration (e.g., Holmqvist, 2003). This implies that organisations that collaborate need to understand the critical components of the job. First, they need to agree on ‘the purpose and goal’ of the collaboration. Collaborators must also be aware of ‘if and how they are interdependent’ in the collaboration, e.g., understanding how, where and when their *complementary resources and capabilities* must be put into play to create value (Brix et al., 2021). To enable this, collaborators need to develop well-functioning *knowledge-sharing routines* and create *effective governance structures* so that the minimum amount of resources are used for coordination and communication. So unnecessary bottlenecks in information processing are created (Dyer et al., 2018). In the following, we briefly elaborate on the nestedness of learning and the links between knowledge and learning.



### 3.1.1 The nestedness of learning

The ground-breaking work of Crossan et al. (1999) sparked an elementary stream of literature in the organisational learning community on the multi-level approach to learning, compared to the previous distinction between individual and organisational learning (see also, e.g., Crossan et al., 2011; Brix, 2017; Morland et al., 2018). The publication by Crossan et al. (1999) introduced the '4i framework' also took traction in the literature on inter-organizational levels of learning, which allowed the creation of a '5i framework' and hence linked these two strands together explicitly (Holmqvist, 2003; Jones & MacPherson, 2006; Brix, 2019; Brix et al., 2021). Table 1 summarises the nestedness of learning and how learning flows from one level to another and back again.

**Table 1:** The Nestedness of Learning

LEVEL OF LEARNING	SUB-PROCESS The 5i's	EXPLANATION
<b>Individual learning</b>	<b>Intuiting</b> (individual)	Is a preconscious recognition of a pattern and/or possibilities inherent in a personal stream of experience e.g., when confronted with new stimuli
	<b>Interpreting</b> (individual)	Is the explaining, through words and/or actions, of an insight or idea to one's self and to others. A process that goes from pre-verbal to verbal
<b>Group / Team learning</b>	<b>Interpreting</b> (team)	As above but when a language is created or being created that enables the framing of a problem or an opportunity
	<b>Integrating</b> (team)	It is the process of developing a shared understanding among individuals and taking coordinated actions and elaborate opportunities together. This work can be done, e.g., as ad hoc actions or via established ways of working
<b>Organizational learning</b>	<b>Integrating</b> (organizational)	Is the process of preparing the new knowledge (and the organization) for implementing/realizing
	<b>Institutionalizing</b> (organizational)	Is the process of ensuring that routinized actions occur. Tasks are defined, actions specified, and organizational mechanisms put into place to ensure that certain actions occur.
<b>Inter-organizational learning</b>	<b>Intertwining</b> (inter-organizational)	Is the process of active engagement between an organization and its knowledge network. For intertwining to work there is a need to have an active feedforward loop (within out) and feedback loop (outside in) to learn from experiences of others and to create new knowledge in collaboration.

**Source:** Authors' summary of Crossan et al. (1999), Jones and MacPherson (2006) and Brix (2017)

The five sub-processes (the 5i's) mentioned in Table 1 represent organisational members' actions to learn at different levels, both internally and externally. The logic is, e.g., that individuals can learn without the group/team learning and that a group/team can learn without the organisation learning, etc. The other way around, Table 1 also shows the agency that is important in organisational learning, that is, that organisational members do engage in the sub-processes at different levels to secure the

creation and use of new knowledge to make the organisation continuously relevant by striking a balance between exploration and exploitation (Huber, 2004). For inter-organisational learning curves, the collaborating organisations must be *receptive* and *transparent* (Larsson et al., 1998). 'Transparent' implies that organisational actors are willing to open up and share knowledge with collaborators, and 'receptive' refers to the ability and motivation of an organisation to use new knowledge that has been created (or shared) with or by partners. It is hence essential that collaborating organisations "(...) *develop their collective knowledge by constructing and modifying their inter-organizational environment, working rules, and options.*" (Larsson et al., 1998, p.287) in such a way that they experience the collaboration makes sense and creates the value that is expected to materialise (see also, e.g., Bjurström et al., 2020).

### **3.1.2 Linking Knowledge and Learning**

As a resource, creating new knowledge does not automatically lead to better performance or organisational learning. The learning processes above represent the logics on which knowledge is created and elaborated. More specifically, the processes of *knowledge creation, retention* and *transfer* are well-established in organisational learning theory (Argote, 2013; Lyles, 2014; Brix, 2017). Knowledge creation occurs when new knowledge is created e.g., by R&D activities, absorbing it from external sources, employing new talents, and by handling situations in new ways. Knowledge retention is the process of using knowledge and building routines around new knowledge, so it gets institutionalized. Knowledge transfer is when knowledge created in one organization can be used to create value in another organization. The same constructs are applied in inter-organizational learning theory, although different constructs with similar meanings are also used. Es-Sajjade (2021), e.g. utilises the three constructs of *knowledge articulation, codification* and *transfer*. Knowledge articulation is the process of making (individual) tacit knowledge into explicit knowledge so individuals can engage in dialogue about the subject. Knowledge codification can, e.g., create knowledge objects such as guidelines, checklists, etc. Knowledge transfer is sharing knowledge objects with individuals to whom the (new) knowledge would be helpful, e.g., to create new or better practices (ibid., p.245). This way of perceiving knowledge, however, has a bias. It could be argued that knowledge that has the characteristics of being codifiable and stored is the knowledge that can respond to 'simple/technical problems'. Knowledge such as step-by-step approaches will work no matter the context – for changing a car battery, installing new software, etc. The knowledge codification and transfer become much more complex and more difficult when the issues at hand

represent complex phenomena, such as, e.g. responding to grand challenges (Mortensen et al., 2020). This leads to a newer discussion in organisational learning theory: that 'best practices' no longer represent 'the golden standard' to achieve successful learning across organisational boundaries (Kringelum & Brix, 2021). The logic is that best practices represent 'false generalisations' because best practices "(...) *depend on the predictability and stability for the environment, and it is well known that the environment of alliances lacks both criteria.*" (Es-Sajjade, 2021; author, year, p. 247). In inter-organizational learning, there is also a distinction between different learning processes that, in different ways, support knowledge creation and transfer. These are *passive*, *active*, and *interactive learning* (Lane & Lubatkin, 1998). The passive and active approaches to learning represent the sharing and use of explicit knowledge, such as technical process specifications, journals (passive learning), and consultancy where advice is given in a set-up that could look like a 'student-teacher relationship' (active learning). When organisations collaborate to create new knowledge in more equal partnerships, they go through the process of interactive learning.

## **4. DISCUSSION AND CONCLUSION**

### **4.1 Inter-organizational Learning and its Applicability to Society 5.0**

So far, we have listed the critical components of inter-organizational learning and elaborated in general terms on the nestedness of learning. We have also unfolded the different sub-processes of learning (the 5i's) at the individual, group/team, organisational and inter-organizational levels of learning. In addition, we have summarised different views on knowledge creation, retention and transfer and their connection to learning, and we have critiqued the false generalisation of 'best practices'. In this section, we will discuss the applicability of the current state of the literature on inter-organizational learning and its ability to explain how organisations can collaborate towards a Society 5.0 agenda. This is done by stating three general points of critique.

*Critique 1:* The current literature is based on the premise that knowledge that has been shared or created in inter-organizational collaborations has to be institutionalised in the individual organisation before it can create value (Holmqvist, 2003; Jones & MacPherson, 2006; see also Anand et al., 2019). This view has a particular 'capitalistic bias' in the context of Society 5.0, where the focus is on a human-centric approach and the creation of value also for the public (Brix & Nielsen, 2023). This implies that current theory must add a perspective to our current understanding of inter-organizational

learning that explains how to value 'for the greater good' is enabled, thus pointing outside of the 'traditional view'.

*Critique 2:* Most research on inter-organizational learning has strong growth agendas and focuses on arguments related to wealth creation, such as efficiency, better and faster R&D, etc. (Mariotti, 2012; Anand et al., 2021). We do not know much about how public, private and third-sector organisations initiate collaborations to define a united vision and strategy for a city, region or alike with a balanced outcome priority of 'both economic and social outcomes' because multiple agendas will be present. Meaning needs to be negotiated (Nielsen & Brix, 2023) – in practice, scholars can learn from, e.g. Brainport Eindhoven, which is a Dutch initiative in the metropol-region of Eindhoven, where organisations from different sectors for years have worked to build a unified brand for the region to create a 'home for pioneers'<sup>4</sup>.

*Critique 3:* While the Society 5.0 agenda and similar concepts are gaining traction politically (Japan Cabinet Office, 2016; Breque et al., 2021), we have yet to learn much about the actual outcomes that can be created. The promises are that social problems can be mitigated by integrating physical space and cyberspace (Japan Cabinet Office, 2016; Huang et al., 2022). However, we do not know much about how this high degree of integration can be adopted in practice and how organisations in collaboration can think about the 'seamless integration of physical and digital lives' in the metaverse.

#### **4.2 Building a new model for inter-organizational Learning in Society 5.0**

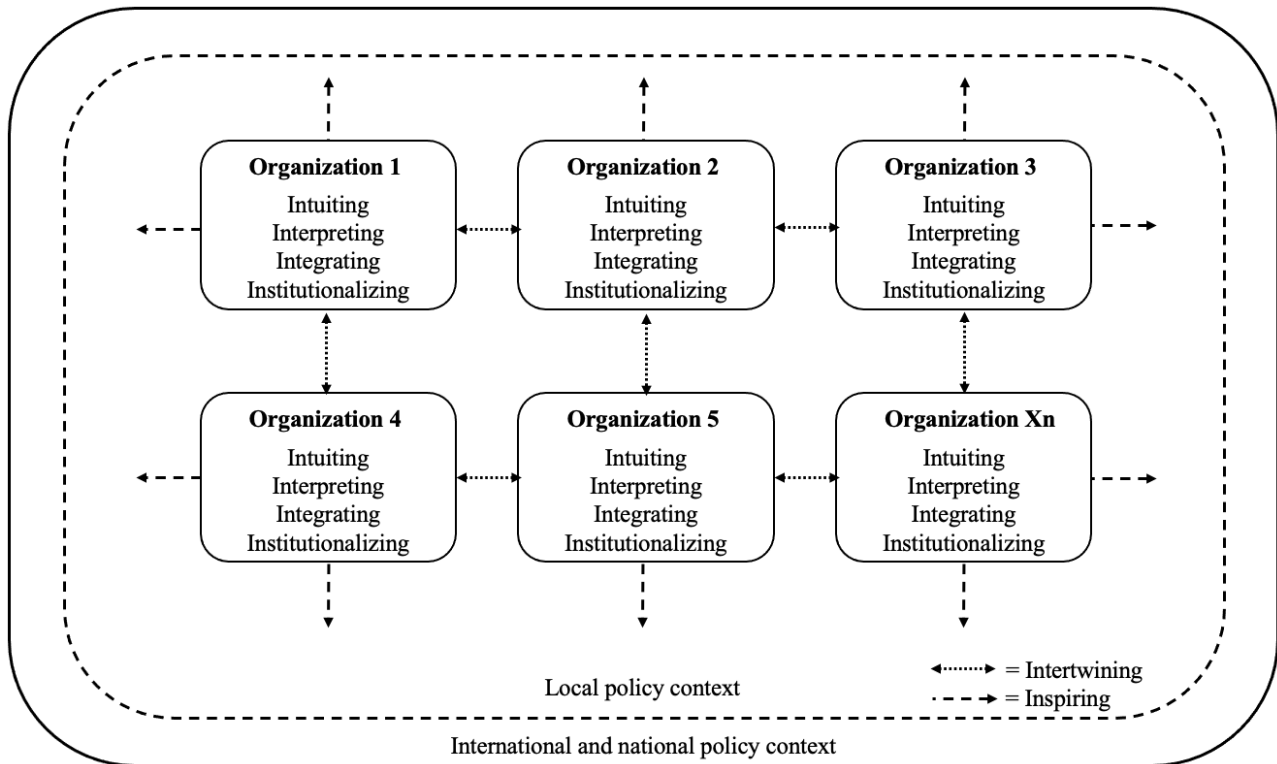
Considering critique points 1 and 3, we propose a model for inter-organisational learning that can act as a first attempt to prescribe how organisations can collaborate to operationalise a Society 5.0 agenda in a local setting. The model provides an example of the 'system' responsible for operationalising the new paradigm cf. the definition (Japanese Cabinet Office, 2016).

Based on the Society 5.0 agenda, we suggest that a new level of learning is added to the literature: *extra-organisational learning*. The sub-process related to extra-organisational learning is *inspiring*. Inspiring is 'The process of making new knowledge valuable to other organisations (and the broader public) available as open source'. See Figure 1 below.

---

Four <https://brainporteindhoven.com/int/>

**Figure 1:** Inter-organizational Learning in Society 5.0



**Source:** Authors' development

The extra-organisational level of learning and the associated sub-process of inspiring represent new additions to the literature on 4i and 5i multi-level models in organisational learning (Crossan et al., 1999; 2011; Holmqvist, 2003; Jones & MacPherson, 2006; Brix, 2017; 2019; Anand et al., 2021). See also Table 2 below, an updated version relating a 'sixth i' to the multi-level models for a Society 5.0 context. The extra-organisational level of learning becomes relevant because of the Society 5.0 vision, where value is envisioned to be created and extended beyond organisational boundaries, and not only for the organisations who are part of the collaboration (Japan Cabinet Office, 2016; Breque et al., 2021; Huang et al., 2022; Nielsen & Brix, 2023) and not only for organisations in the real world, but also for organisations and actors in the Metaverse. This implies a new way of thinking about inter-organisational learning.

Traditionally, research regarding value creation and appropriation has been isolated within organisations that collaborate (e.g., Anand et al., 2021). A good example of this 'closed loop' way of thinking is found in the following quote: *"As long as the size of the joint pie is constant, the interaction becomes a zero-sum game in which only competitive efforts are rewarded (...) most socio-economic*

*interaction involves the individual trade-off decisions of each actor regarding how much of his/her limited efforts are to be spent on collaborating and internally competing, respectively.” (Larsson et al., 1998, p.288).*

**Table 2:** The Nestedness of Learning – adding a ‘sixth i’ for Society 5.0

LEVEL OF LEARNING	SUB-PROCESS	EXPLANATION
<b>Individual learning</b>	<b>Intuiting</b> (individual)	Is a preconscious recognition of a pattern and/or possibilities inherent in a personal stream of experience e.g., when confronted with new stimuli
	<b>Interpreting</b> (individual)	Is the explaining, through words and/or actions, of an insight or idea to one’s self and to others. A process that goes from pre-verbal to verbal
<b>Group / Team learning</b>	<b>Interpreting</b> (team)	As above but when a language is created or being created that enables the framing of a problem or an opportunity
	<b>Integrating</b> (team)	Is the process of developing shared understanding among individuals and taking coordinated actions and to elaborate opportunities together. This work can be done e.g., as ad hoc actions or via established ways of working
<b>Organizational learning</b>	<b>Integrating</b> (organizational)	Is the process of preparing the new knowledge (and the organization) for implementing/realizing
	<b>Institutionalizing</b> (organizational)	Is the process of ensuring that routinized actions occur. Tasks are defined, actions specified, and organizational mechanisms put into place to ensure that certain actions occur.
<b>Inter-organizational learning</b>	<b>Intertwining</b> (inter-organizational)	Is the process of active engagement between an organization and its knowledge network. For intertwining to work there is a need to have an active feedforward loop (within out) and feedback loop (outside in) to learn from experiences of others and to create new knowledge in collaboration.
<b>Extra-organizational learning</b>	<b>Inspiring</b> (extra-organizational)	Is the process of making new knowledge which is considered to have value to other organizations and the public domain within the real world and the Metaverse available as open source.

**Source:** Figure 1 updated with the authors’ contribution (the extra-organizational learning level)

With the extra-organizational level of learning and the sub-process of inspiring, we argue for the relevancy of ‘opening the learning loop’ when possible for the broader benefit of people and society (Japan Cabinet Office, 2016; Breque et al., 2021; Huang et al., 2022; Nielsen & Brix, 2023; Brix & Nielsen, 2023). The idea is that actors in local contexts can start bottom-up on building relationships – e.g., cf. the suggestions made by Nielsen and Brix (2023) – and engage in the process of defining a shared vision for how they would like to help solve one or more grand challenges from the point of departure in their local setting. We hope this paper will inspire scholars and practitioners to engage in the Society 5.0 agenda.

## REFERENCES

- Anand, A., Brøns Kringelum, L., Øland Madsen, C., & Selivanovskikh, L. (2021). Interorganizational learning: a bibliometric review and research agenda. *The Learning Organization*, 28(2), 111-136.  
<https://doi.org/10.1108/TLO-02-2020-0023>
- Anand, A., & Brix, J. (2022). The learning organization and organizational learning in the public sector: a review and research agenda. *The Learning Organization*, 29(2), 129-156.  
<https://doi.org/10.1108/TLO-05-2021-0061>
- Boerner, C. (2016). *Inter-organizational Learning*. In: Augier, M., Teece, D. (Eds.), *The Palgrave Encyclopedia of Strategic Management*. Palgrave Macmillan, London.  
[https://doi.org/10.1057/978-1-349-94848-2\\_488-1](https://doi.org/10.1057/978-1-349-94848-2_488-1)
- Bjurström, Erik and Lund, Morten and Nielsen, Christian, (2020) Are You Ready to Collaborate? Improving the Quality of University-Industry Collaborations, *Journal of Behavioural Economics and Social Systems*, Vol. 2, No. 1. pp.81-112, 2020.  
<https://ssrn.com/abstract=3671271>
- Bovaird, T., Flemig, S., Loeffler, E., & Osborne, S. P. (2019). How far have we come with co-production—and what's next?. *Public Money & Management*, 39(4), 229-232.  
<https://doi.org/10.1080/09540962.2019.1592903>
- Breque, M., De Nul, L. & Petridis, A. (2021) *Industry 5.0: Towards a sustainable, human-centric and resilient European industry*, European Commission, Directorate-General for Research and Innovation, R&I Paper Series, Policy Brief.  
ISBN 978-92-76-25308-2
- Brix, J. (2017). Exploring knowledge creation processes as a source of organizational learning: A longitudinal case study of a public innovation project. *Scandinavian Journal of Management*, 33(2), 113-127.  
<https://doi.org/10.1016/j.scaman.2017.05.001>
- Brix, J. (2019). Ambidexterity and organizational learning: revisiting and reconnecting the literatures. *The Learning Organization*, 26(4), 337-351.  
<https://doi.org/10.1108/TLO-02-2019-0034>
- Brix, J. (2021). Interorganizational learning: where are we now and where is the research taking us?. *The Learning Organization*, 28(2), 105-110.  
<https://doi.org/10.1108/TLO-02-2021-261>
- Brix, J. and Nielsen, C. (2023) Here comes Society 5.0 and Industry 5.0: What do we do with human-centred development in the Nordic countries?, Working Paper Aalborg University Business School.
- Brix, J., Tuurnas, S., & Mortensen, N. M. (2021). Creating opportunity spaces for co-production: professional co-producers in inter-organizational collaborations. In *Processual perspectives on the co-production turn in public sector organizations* (pp. 157-175). IGI global.
- Carayannis, E. G., & Morawska-Jancelewicz, J. (2022). The futures of Europe: Society 5.0 and Industry 5.0 as driving forces of future universities. *Journal of the Knowledge Economy*, 1-27.  
<https://doi.org/10.1007/s13132-021-00854-2>
- Choi, T., & Chandler, S. M. (2015). Exploration, exploitation, and public sector innovation: An organizational learning perspective for the public sector. *Human Service Organizations: Management, Leadership & Governance*, 39(2), 139-151.  
<https://doi.org/10.1080/23303131.2015.1011762>

Nielsen, C. and Brix, J. (2023) 'Using Society 5.0 as Lever for Strategic Innovation: Mitigating grand challenges in local regions', *R&D Management Conference*, Seville, Spain, June 17-21.

Colquitt, J. A., & Zapata-Phelan, C. P. (2007). Trends in theory building and theory testing: A five-decade study of the Academy of Management Journal. *Academy of Management Journal*, 50(6), 1281-1303.  
<https://www.jstor.org/stable/20159472?seq=1&cid=pdf->

Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review*, 24(3), 522-537.  
<https://www.jstor.org/stable/259140?seq=1&cid=pdf->

Crossan, M. M., Maurer, C. C., & White, R. E. (2011). Reflections on the 2009 AMR decade award: do we have a theory of organizational learning?. *Academy of Management Review*, 36(3), 446-460.  
<https://www.jstor.org/stable/41319180>

Dyer, J. H., Singh, H., & Hesterly, W. S. (2018). The relational view revisited: A dynamic perspective on value creation and value capture. *Strategic Management Journal*, 39(12), 3140-3162.  
<https://doi.org/10.1002/smj.2785>

Es-Sajjade, A. (2019). Developing alliance capability for strategic renewal. In Tuncdogan, A., Lindgreen, A., Volberda, H., & van den Bosch, F. (Eds.). (2019). *Strategic Renewal: Core Concepts, Antecedents, and Micro Foundations*. Routledge. (pp. 238-251).

European Commission (2022). The Corporate Sustainability Reporting Directive (CSRD).

Gassmann, O., & Ferrandina, F. (2021). Connected Business: Creating Value in the Networked Economy. In *Connected Business* (pp. 3-33). Springer, Cham.

Gershenfeld, N., Gershenfeld, A., & Cutcher-Gershenfeld, J. (2017). *Designing reality: How to survive and thrive in the third digital revolution*. Hachette UK.

Holmqvist, M. (2003). A dynamic model of intra-and interorganizational learning. *Organization Studies*, 24(1), 95-123.  
<https://doi.org/10.1177/0170840603024001684>

Huang, S., Wang, B., Li, X., Zheng, P., Mourtzis, D., & Wang, L. (2022). Industry 5.0 and Society 5.0—Comparison, complementation and co-evolution. *Journal of Manufacturing Systems*, 64, 424-428.  
<https://doi.org/10.1016/j.jmsy.2022.07.010>

Huber, G. P. (2004). *The necessary nature of future firms: Attributes of survivors in a changing world*. Sage Publishers.

Japan Cabinet Office (2016), "Society 5.0" Available online:  
[https://www8.cao.go.jp/cstp/english/society5\\_0/index.html](https://www8.cao.go.jp/cstp/english/society5_0/index.html) (accessed on Dec 2022).

Jones, O., & Macpherson, A. (2006). Inter-organizational learning and strategic renewal in SMEs: extending the 4I framework. *Long Range Planning*, 39(2), 155-175.  
<https://doi.org/10.1016/j.lrp.2005.02.012>

Klitgaard, R. (2023) *Bold and Humble: How to Lead Public-Private-Citizen collaboration, with five success stories*, Claremont Graduate University Press, Open Access.

Kringelum, L. B., & Brix, J. (2020). Critical realism and organizational learning. *The Learning Organization*, 28(1), 32-45.  
<https://doi.org/10.1108/TLO-03-2020-0035>



Nielsen, C. and Brix, J. (2023) 'Using Society 5.0 as Lever for Strategic Innovation: Mitigating grand challenges in local regions', *R&D Management Conference*, Seville, Spain, June 17-21.

Lane, P. J., & Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19(5), 461-477.

[https://doi.org/10.1002/\(SICI\)1097-0266\(199805\)19:5%3C461::AID-SMJ953%3E3.0.CO;2-L](https://doi.org/10.1002/(SICI)1097-0266(199805)19:5%3C461::AID-SMJ953%3E3.0.CO;2-L)

Larsson, R., Bengtsson, L., Henriksson, K., & Sparks, J. (1998). The interorganizational learning dilemma: Collective knowledge development in strategic alliances. *Organization Science*, 9(3), 285-305.

<https://psycnet.apa.org/doi/10.1287/orsc.9.3.285>

Lyles, M. A. (2014). Organizational Learning, knowledge creation, problem formulation and innovation in messy problems. *European Management Journal*, 32(1), 132-136.

<https://doi.org/10.1016/j.emj.2013.05.003>

March, J.G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71-87.

<https://www.jstor.org/stable/2634940?seq=1&cid=pdf->

Mariotti, F. (2012). Exploring interorganizational learning: a review of the literature and future directions. *Knowledge and Process Management*, 19(4), 215-221.

<https://doi.org/10.1002/kpm.1395>

McMullin, C. (2022). *Non-profit Organizations and Co-production: The Logics Shaping Professional and Citizen Collaboration*. Taylor & Francis.

Mortensen, N. M., Brix, J., & Krogstrup, H. K. (2020). *Reshaping the hybrid role of public servants: identifying the opportunity space for co-production and the enabling skills required by professional co-producers*. In Sullivan, H., Dickinson, H. and Henderson, H. (Eds.), *The Palgrave Handbook of the Public Servant*, Palgrave MacMillan, 1-17.

Nagasato, Y., Yoshimura, T., & Shinozaki, R. (2018). Realizing Society 5.0 Expectations from Japanese Business. *Journal of Information and Management*, 38(1), 3-8.

[https://doi.org/10.20627/jsim.38.1\\_3](https://doi.org/10.20627/jsim.38.1_3)

Nielsen, C. and Brix, J. (2023) Towards Society 5.0: Enabling the European Commission's Policy Brief 'Towards a sustainable, human-centric and resilient European Industry', *Journal of Behavioural Economics and Social Systems*, 5(1)

O'Connor, G.C., Corbett, A.C., & Peters, L.S. (2018). *Beyond the champion: institutionalizing innovation through people*. Stanford University Press.

Rosenstand, C.A.F., Brix, J. og Nielsen, C. (2023) 'Society 5.0 and the Metaverse as gamechangers for business model innovation'. In Aagaard, A. and Nielsen, C. (Eds.): *Business Model Innovation: Game Changers and Contemporary Issues*, Palgrave.

Schmitt, A., Raisch, S., & Volberda, H. W. (2018). Strategic renewal: Past research, theoretical tensions and future challenges. *International Journal of Management Reviews*, 20(1), 81-98.

<https://doi.org/10.1111/ijmr.12117>

Taran, Y., Boer, H., & Nielsen, C. (2021). *The Business Model Innovation Process: Preparation, Organization and Management*. Routledge.

van Winkelen, C. (2010). Deriving value from inter-organizational learning collaborations. *The Learning Organization*, 17(1), 8-23.

<https://doi.org/10.1108/09696471011008215>

Nielsen, C. and Brix, J. (2023) 'Using Society 5.0 as Lever for Strategic Innovation: Mitigating grand challenges in local regions', *R&D Management Conference*, Seville, Spain, June 17-21.

Volberda, H. W., Khanagha, S., Baden-Fuller, C., Mihalache, O. R., & Birkinshaw, J. (2021). Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms. *Long Range Planning*, 54(5), 102110.

<https://doi.org/10.1016/j.lrp.2021.102110>