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Platform Thinking within the Third Generation Science Park Concept: Emerging Cases from Finland and the Netherlands[†]

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Abstract

This paper is intended as an opening of a dialog on how to apply platform thinking in the development of innovation environments. It will briefly describe a new STP (Science and Technology Park) concept called 3GSP (Third Generation Science Park), which is gaining momentum in Finland. The paper explains the fundamental changes that are currently taking place in the global innovation environment and explains why platform thinking is becoming an essential element in ecosystem development. The theoretical background and classifications of platforms are described and the benefits to be gained from STP perspective are highlighted. The paper emphasizes especially the role of so called 'competence platforms' and explains the main characteristics of a fully working competence platform. The role of competence platforms in understanding serendipity and as a fundamental factor in building the team is also highlighted. The paper analyses from STP perspective several practical examples, where platform thinking supports the emergence of new innovation environments, including Urban Mill (Finland) and Meetberlage (Netherlands). The requirements for comprehensive competence platform services are presented and their potential to support community building and therefore ecosystem development is illustrated. This analysis will provide STP practitioners with new models for applying platform thinking and will help to establish co-creation, open innovation and serendipity management practices. The case studies presented will help STP management teams to evaluate the benefits of competence platforms in different contexts.

Keywords


Platform thinking, Science park management, Third Generation Science Park (3GSP), Serendipity management, Competence platforms, Creative communities, Self-organized engagement, Ecosystem co-creation, Innovation acceleration, Co-effectuation, Co-design, Co-learning, Espoo Innovation Garden (EIG), Urban Mill, Meetberlage

1. THE TRANSFORMATION OF THE THIRD GENERATION SCIENCE PARK (3GSP) MODEL

[†] This is revised version of the paper which was presented at session 1, 2015 UNES-CO-WTA International Training Workshop, 22th-25th Sep. 2015, Daejeon, Korea

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World Technopolis Review
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The 3GSP concept was developed in the netWork Oasis project in Joensuu Science Park, Finland few years ago. The co-author of this paper, Ilkka Kakko, was in charge of this development initiative, which is still known for the radical and disruptive elements it introduced into the innovation environment design process. Those elements were designed, piloted and tested in a real STP environment in Joensuu.

The main characteristics of a 3GSP concept were explained (Kakko, 2013) and consist of following elements:

- Focus on individuals and community building
- Pre-incubation – or network incubation as the 3GSP term

goes – is strongly supported

- Ecosystem thinking
- Healthy balance between effectual entrepreneurship, start-ups, SMEs and established companies, also social entrepreneurship and virtual teams/organizations are supported
- Investments directed into advanced communication technology and community building – not into the real estate and new infra
- Geographically dispersed locations – for example having a node (co-working space) in downtown location and main activities in the university campus area
- Workspace design – both physical and virtual collaboration platforms – supporting open innovation principles and community building
- Understanding the importance of “sticky knowledge” in regional development context
- Serendipity management methodologies widely used

The continuous transformation of our society and global innovation scheme has also changed the 3GSP concept. Just two years ago platform thinking was only emerging, but today it has become mainstream in pioneering business areas. We find that collaboration is happening more and more on a global level and thematic approaches have proved to be effective. This has led to new alliances in many areas (capacity building, competence creation, networked businesses, new business models etc.) and has generated an alternative economic model called “sharing economy”. The repeated transformation of business environment has increasingly put pressure to the traditional STP model, which is strongly based on Triple Helix thinking. The ongoing development is extremely powerful; it happens very fast and has a wide range of consequences. This disruption is happening for example in Finland where the traditional STP model, which was formerly run by Technopolis Plc, has changed in major cities, because of Technopolis’ strategic shift towards pure real estate management. This has left the scene open for new combinations of solutions. The transformation is continuing in multiple new directions and one concrete example is the emergence of Espoo Innovation Garden.

2. ESPOO INNOVATION GARDEN AS A PRACTICAL EXAMPLE OF 3GSP CONCEPT

The rapid development of the Finnish innovation intermediary market has changed the structure of innovation environment over the last few years. Technopolis Plc., which was earlier the dominant Triple Helix STP organization in Finland, revised its strategy a few years ago and became a pure real estate company. It stopped all its publicly funded development projects and outsourced incubation and acceleration programs to other organizations in the regions. However, we believe that Technopolis will follow platform thinking and act accordingly in the future.

Technopolis’ strategic move of course caused turbulence in the market, but it also opened new opportunities for flexible and innovative solutions. The development happened at the same time as a fundamental change in Finnish university structure. Three metropolitan area universities merged to form a new entity called Aalto University. Three university disciplines (technology, business and arts) were combined and the merger also led to a huge campus development program introduced last year. Otaniemi Campus area will in the future accommodate other university campuses that are currently geographically dispersed throughout the Metropolitan area. The third fundamental change shaping the area is the extension of Helsinki’s metro system. From 2017 the Otaniemi Campus and other Espoo Innovation Garden hubs, Tapiola and Keilaniemi, will be fully connected to downtown Helsinki and rest of the hubs in Espoo with only a few minutes traveling time.

These changes highlight the importance of Espoo Innovation Garden (EIG) as a regional and national innovation hub and have driven the stakeholders to collaborate fully in developing EIG as the main innovation hub in Northern Europe. The initiative has very good chances of achieving this vision because even today the Espoo Innovation Garden is inhabited by 44,000 citizens and hosts an almost equal number of jobs, 16,000 of which are in ICT or ICT-intensive service sectors. 5,000 researchers and 16,000 students can also be found in the campus area. It accommodates hundreds of companies of which 200 are foreign and a mix of 110 nationalities lives and works in the area. (Lappalainen et al., 2015)

The reason why Espoo Innovation Garden forms a perfect example of a 3GSP model is that it has replaced the traditional STP organization with an emergent innovation ecosystem. The transformation of the new innovation environment is happening in co-creation with all stakeholders and platform thinking is strongly used in the design and implementation phases. The overall structure is continuously evolving and consists of

many independent entities, which are geographically dispersed (although in near proximity). The kernel of this structure is called “Innovation Alley” and is formed by three fairly new entities namely Design Factory, Start-up Sauna and Urban Mill. Start-up Sauna is also the host of the world famous start-up gathering called SLUSH, which itself demonstrates the full potential of a global approach and fresh thinking.

If we compare this structure with the traditional Triple Helix model, we may see that all the main elements used in Triple Helix model are replaced with platform thinking with more dynamic practices. The incubation and accelerator programs in the area are driven by pull-approach, co-creation principles and open innovation 2.0 practices. Also the global trend to increase thematic focus is well taken care of (Miikki et al., 2014); Urban Mill is a global hub for urban development (Rytönen et al., 2014) and the brand new accelerator Vertical (Avner, 2015) located nearby will become a hub for healthtech business. The proximity of major global conglomerates like Microsoft, Kone, Neste Oil, Samsung and VTT Technical Research Centre of Finland adds value to the overall ecosystem.

3. PLATFORM THINKING

The first conceptual definition of platforms, which we noticed, was by John Hagel, John Seely Brown and Lang Davison in their brilliant book “The Power of Pull” (2010). They introduced the notion ‘pull platforms’. The authors defined the new phenomenon as follows (Hagel III et al., 2010):

“Pull platform is used metaphorically to describe frameworks for orchestrating a set of resources that can be configured quickly and easily to serve a broad range of needs”.

A few years ago, with a wide set of case examples, they were already able to explain the vital benefits of platform thinking. They also predicted with amazing accuracy the vast implications that platform thinking will bring to the market place.

The fundamental changes that accompany every shift in the industries that are getting transformed by the platform thinking are 1) new networked markets are created, 2) new sources of supply start to emerge and, 3) new consumption patterns are created. (Choudary, n.d.) This is certainly true when talking about traditional platforms, but we want to add to that

also the new dimension offered by competence platforms, namely that 4) new and unique combinations of competences, will be created. (Kakko et al., 2006) We will discuss this later in more detail, but let’s try to elaborate the idea of pull platforms a bit deeper.

John Hagel et al. have analysed ‘pull’ driven platform thinking and they concluded that to exploit the opportunities created by uncertainty, pull platforms help people to come together and innovate in response to unanticipated events, drawing upon a growing array of highly specialized and distributed resources. With this feature a pull platform becomes a real asset. In volatile and uncertain conditions developments and encounters are often unexpected and hence unpredictable. Pull platforms, and as we will show later on the concrete form of them called competence platforms, will help teams to respond and to prepare for the unexpected.

One of the positive consequences generated by platform thinking is understood when platforms are studied from the learning perspective. (Markkula et al., 2013) Tacit knowledge is in many respects the most valuable type of knowledge but also the most difficult to acquire. It has been impossible to think about ways of scaling tacit knowledge effectively, but some first experiences indicate that tacit knowledge can be created and distributed at scale when a critical mass in the platform is achieved. This largely depends on the trust and engagement level of communities working within the platform, so the gravity factor becomes vital.

Interestingly John Hagel et al. (2010) come close to what we call competence platforms when they describe ‘creation spaces’. They believe that the challenge in designing and managing ‘creation spaces’ is to provide scalable environments that can accommodate a large and growing number of participants and create conditions for them to learn faster from each other as the number of participants grows. Our experience using Skillhive (a Finnish competence platform service explained later) within our customer project validates this theory. Some of the swarms created within the platform quickly self-developed in an inspiring way, so that learning was the most important driver for joining the swarm. And to certain extent all participants were learning faster during the process. At Urban Mill participants from over 500 organisations, 100 RDI experiments and 50 startup teams came together. From this cross-fertilization new creative activities have emerged, both self-organised and facilitated by the Urban Wheel Accelerator Process.

Table 1. Pipeline-thinking vs. platform-thinking (originally by Ilkka Kakko)

Pipeline - thinking	Platform - thinking	Main benefits of the platform - thinking
Command and control Gate-keepers	Collaboration, Low entry, zero-friction	Engagement, Creativity
Institutions, Shareholder value, Career	Entrepreneurship, Stakeholder value, 'Collectives'	Sustainable ecosystem thinking
Project management	Serendipity management	Disruption
'From me to you' – lectures, Conferences, "Get and Give" Teaching	'From anybody to anybody' – sessions, Un-conferences, "Give and Get" Learning	Apprentice attitude, Diversity
Innovation intermediaries Brokering Regional/national approach	Competence platforms, Community building, Global approach	New and unique combinations of competences
Push principle, Individuals as consumers and resources	Pull principle, Individuals as co-creators and supporters	Attraction, Gravity Flexibility, More effective allocation of talent (self-organized)

The fundamental differences between pipeline thinking and platform thinking are described in the Table 1. The conclusion easily seen in the table is that platform thinking provides great benefits, which are urgently needed in the complex and uncertain circumstances we are all facing today.

4. BRIEF INTRODUCTION TO PLATFORMS

Platforms, as we understand them, have always existed. Even ancient Greece was known about Agora, a meeting spot and market place, the arena where all collaboration and interaction happened. According to Wikipedia¹:

The Agora (/ˈæɡərə/; Ancient Greek: Ἀγορά, Agorá) was

a central spot in ancient Greek city-states. The literal meaning of the word is "gathering place" or "assembly". The agora was the center of athletic, artistic, spiritual and political life of the city. The Ancient Agora of Athens was the best-known example. The notion itself is based on the two Greek verbs ἀγοράζω, agorázō, "I shop", and ἀγορεύω, agoreúō, "I speak in public"

One development stream relevant to the approach of this paper originates back to 1980's, when some single enterprise centric models were implemented (IBM, Zachman Framework, VERA, GERAM). The focus was in ICT enabled solutions improving usability with technology development. The following step was in 1990's when more network-centric development projects were launched, with an increased emphasis on networks and their properties. In Finland the Freenet Fin-

¹ <https://en.wikipedia.org/wiki/Agora>

land² project was launched in 1993 (70,000 users in 1997) and many other CSCW type of activities was also run.

The momentum for platform development came around the year 2000, with the introduction of the notions Virtual Enterprise, Virtual Organization and especially Virtual Organization Breeding Environment (VBE), followed by the foundation of PRO-VE organization. Later on, around 2002-2003, the research framework expanded to Collaborative Networked Organizations (CNOs) and ECOLEAD project consortium was established in 2004. ECOLEAD is still considered to be the cornerstone of the academic research in this VBE area.

At the same time some parallel developments and projects with overlapping areas of interest and piloting include (Matos and Afsarmanesh, 2008):

- Grid community, which moved towards virtual organizations and was trying to consider business perspective, as in the case of Enterprise Grid Architecture initiative (EGA 2005)
- E-government, which is a wide area but has some common elements, when it addresses the cooperation among different governmental organizations, as illustrated by the Federal Enterprise Architecture (FEA 2005)
- Social networks and virtual communities are the areas that although at that time not offering much in terms of reference models, have developed considerable background in terms of basic properties of networks with a strong basis on graph theory
- Collaborative networks mapping initiatives such as THINKcreative, VOMap and others which have contributed to the identification of the research in this area

The global introduction of social media platforms, like Facebook, Twitter, LinkedIn, Instagram, Pinterest etc. not only accelerated technological development but also changed the social and economical aspects of our behaviour. The use of these platforms inside the business community together with the introduction of so called Enterprise Social tools like Yammer, Jive Social Business Platform, Salesforce Chatter and SAP Jam enabled the wide acceptance of connectivity within and across organizational borders. In this respect the traditional institutional business world was lacking years behind the open source community, where the use of different development platforms like Linux and Ubuntu were already an everyday practice.

5. PHYSICAL SPACES AS PLATFORMS

The history of spaces considered as platforms originates back to ancient Athens and Agora, or perhaps even further to the history of mankind, even back to the times when our hunter-gatherer ancestors gathered together around the camp fire. “I shop” and “I speak in public” – so trade and knowledge sharing were the main motivators at that time.

Can we verify that physical environment can also act as a platform? We definitely often hear of physical places described as platforms. Certainly some artefacts and boundary objects, like ancient totem poles have this feature embedded. To clarify this from academic and also practical perspectives, we can refer to the definition of a platform by the distinguished platform expert Sangeet Paul Choudary (Choudary, n.d.):

“A platform is a plug-and-play business model that allows multiple participants (producers and consumers) to connect to it, interact with each other and create and exchange value.”

According to Choudary, a platform operates by architecting incentives that repeatedly pull participants to the platform, by providing a central infrastructure on which participants create and exchange value, and by matching participants with each other and with content/good/services created on the platform.

Applying platform thinking in the design of physical environments is a new phenomenon. It is surprising that even some of the most advanced organizations still use the ‘office as usual’ – philosophy, as we call it – which has lasted for more than a hundred years. Traditional office design followed the organizational structure of the rigid industry age thinking. The recent rise of co-working movement and freelancer economy was also the spark to change attitudes in the areas of office layouts and organizational communication patterns. That, together with the widespread usage of social media tools and the increase of freelancer work force, intensified the development of working environments towards more open and more social structures.

Co-working movement had also wide impact; the rise of creative hubs in metropolitan areas and the buzz created around these spaces, also attracted more traditional business people to study the phenomenon. Google, Facebook and Apple, among others, started to focus on the design of their physical

² https://fi.wikipedia.org/wiki/Freenet_Finland

facilities from a fresh perspective. The new trend started around 2009-10 with the introduction of Googleplex and Apple's Spaceship design initiatives. The architectural solutions and management practices in these environments are based on the assumption that increasing diversity and social density will automatically lead to more creativity and serendipitous interactions. Although this is a simplified perspective of serendipity, it started a boom and soon the notion 'serendipity' became the buzzword of these developers and the mantra of Silicon Valley management style.

In Europe the co-working movement created initiatives like HUB, nowadays known as Impact Hub, WeWork originally from US, Seats2Meet, Talent Garden in Italy and Design Factory and Urban Mill at Espoo Innovation Garden in the metropolitan area of Helsinki. In the case study chapter of this paper, we will examine more closely both Meetberlage in Amsterdam, which is one of the leading locations in Seats2Meet, and Urban Mill, a dynamic co-creation platform within the Espoo Innovation Garden.

6. PLATFORM CLASSIFICATION

Platforms are quickly becoming an important topic in business development and therefore also in the innovation intermediary business. The vivid discussion around the most prominent business cases has brought the notions of 'platform' and 'platform thinking' into the limelight. Disruptive business models are gaining momentum and the triumphant business endeavours like Facebook, Google, and Amazon are showing us how to succeed in the times of the 'Postnormal Era'. Platforms are here to stay and surely also to flourish; new variations with revolutionary characteristics are emerging also from these already existing platforms.

Platforms. What are they then? What is their role? How do they start to shape industries? How can we, as business owners, communities or private persons benefit from them? What are the good reasons for why we should try to understand these mechanisms?

We are witnessing an enormous shift towards the platform driven business environment. It has already transformed many industries – such as publishing, media, hotel and transportation businesses – not to mention the eminent power of social media platforms even within traditional businesses.

Platforms that work well enable low-entry, even close to ze-

ro-friction interaction between a wide varieties of participants. In fact, we all have experienced weak signals of this every time we have visited our city's market squares. A platform is an organized setting where producers and service providers meet with the customers and consumers, where their roles may swap freely according to personal preferences. Platforms are places where 'I shop and I speak in public' principle is supported. The format and infrastructure of platforms have evolved just in recent years enormously, but they still carry some ambience of the ancient market squares.

There are several classifications of platforms according to their purpose and features. Our main classification is between physical and virtual solutions, although the hybrid model seems to be the most advanced. (Modig, 2012) We divide platforms into exchange and development platforms and the argument here is that the purpose and the roles of platform providers and participants are very different in these categories. Our classification is presented in the Figure 1. Note: The figure looks like an organisational chart or hierarchy, but it is not a hierarchical model. It is more like an ontological model. In real business ecosystems these four types of platform can mix perfectly and overlap as illustrated in the Urban Mill case study in Figure 4.

We have classified platforms across four types:

- 1) Communication platforms – like Facebook, Twitter, and LinkedIn
- 2) Trading platforms - like eBay, Etsy, Airbnb and Uber
- 3) Technology platforms – like Apple and Android development ecosystems, Amazon Web Services and Ubuntu,
- 4) Competence platforms – still in an emergent phase, some limited services available, but many promising development projects are ongoing

7. COMPETENCE PLATFORMS

Recently a new perspective around platform development has started to emerge. This interest focuses on certain type of platforms, where serendipity can be harnessed. These are either physical premises and artefacts (like Urban Mill and Meetberlage) or virtual community and collaboration platforms. In the most interesting cases they form hybrid solutions, where the key features of physical and virtual are embedded in an engaging way. We have started to call them competence plat-

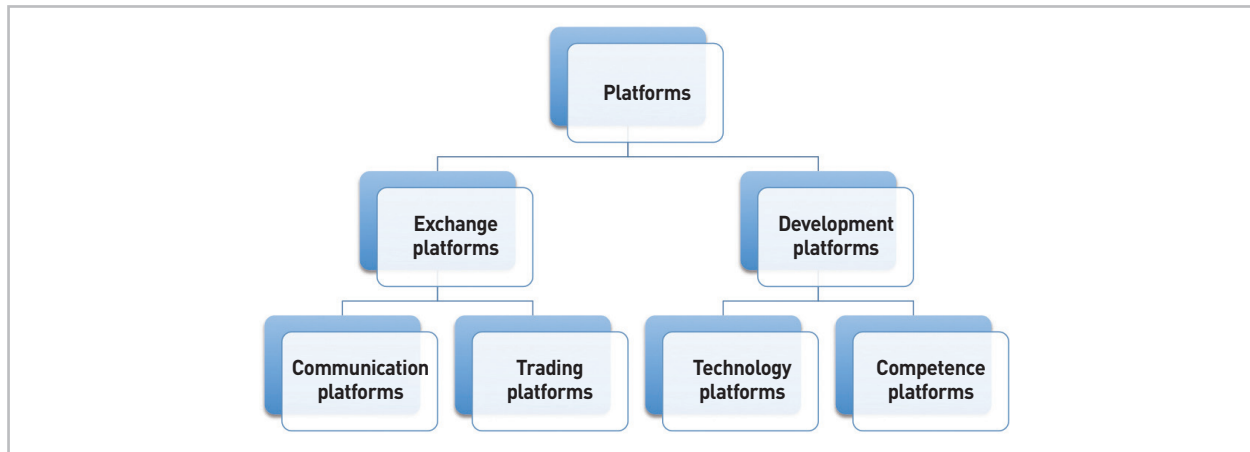


Fig. 1. The classification of platforms

forms (Kakko, 2014b) and they form the fourth dimension of platform classification. So far they are less developed than the other three, but there are many ongoing and interesting development projects in the competence platform area. We will describe them in the Case Study chapter.

Competence platforms work as a natural base for vibrant community creation. In this respect they support entrepreneurial ecosystem development. Competence platforms support coincidency – a mix of diversity and density – in an optimal way. But they also offer enough tranquillity and solitude for co-created insights and value creation. They are the workspaces of the future, more like a ‘collective’ than a co-working space or an office, more like a breeding environment than a business infrastructure.

Competence platforms attract participants to them; they allow the participants to combine competences, to create favourable conditions for value creation and to enable collaborative offerings. The fundamental design approach of competence platforms is based on serendipity management principles and ‘pull’ approach. Although physical and virtual environments are designed to support ‘coincidency’ the main focus is on enabling the most important elements of serendipity process, namely insight, discovery and value creation.

The practices that were once successful during the industrial age are no longer valid today. In a world where new combinations of competences are continuously created those who base their actions on the rigid pipeline thinking are facing

enormous challenges. The operational principles of industrial age do not match with the conditions of the Postnormal Era. The fundamental requirement for a well working innovation environment today highlights a fluid, anti-fragile and adaptive perspective. Successful solutions are based on certain underlying principles and the main planning parameters for an ideal innovation environment can be listed as:

- 1) All interaction is based on pull principle
- 2) Operational practices respect the importance of serendipity
- 3) Open innovation 2.0. principles are widely in use
- 4) Different types of platform are embraced in a balanced way

Why would competence platforms disrupt the innovation intermediary market in the near future? In short, it is because the competence platforms enable to move the focus from resource efficiency to flow efficiency.³ They are more effective, engaging, interactive, agile and they are leveraged by ‘respect serendipity’ principles. Competence platforms are supporting the vital phases of idea elaboration and business creation in the following essential areas:

- Team building and competence sharing according to the serendipity management approach
- Idea sharing and co-creation
- Combined idea and business proposal elaboration
- Embedded business model design
- Full integration with project management tools

³ https://en.wikipedia.org/wiki/Volatility_uncertainty_complexity_and_ambiguity

In a well working competence platform, interactions happen almost without an outside moderator; if some moderation is needed it is based on peer-to-peer communication and support. Competence platform is a low-entry and almost a zero-friction environment providing both physical and virtual solutions to participants. But the most important feature is that this type of platform supports in an organic way the growth of the surrounding innovation ecosystem i.e. through spill-over effects.

The design principles for a well working competence platform can be divided in four areas described in the figure 2 below:

- Connection:** how easily others can plug into the platform to share and transact
- Gravity:** how well the platform attracts participants
- Flow:** how well the platform fosters the exchange and co-creation of value
- Emergence:** how all elements of the serendipity process are supported

Fig. 2. The design principles of a fully working competence platform (modified from Sangeet Paul Choudary)

8. IMPLICATIONS FOR STP DEVELOPMENT

The VUCA (volatile, uncertain, complex and ambiguous) environment of the Postnormal Era sets new requirements for innovation intermediaries. In these highly unpredictable conditions individuals, communities and businesses face an urgent need to create new tools and collaboration patterns. Competence platform thinking has proved to be productive in the complex business environment. The role of low-entry platforms rapidly becomes vital - not only for the survival but also for the impact creation. In this respect it is surprising that the management teams of science and technology parks (STPs) so far have only limited understanding of the benefits gained by platform thinking. The Triple Helix model is still dominant and is still being followed with daily operations being organized according to its model, even though the limitations of the thinking are so evident in the contemporary business environments. Triple Helix mostly represents the old, industrial push-model and should be replaced with platform thinking. (Matikainen and Mikkela, 2006)

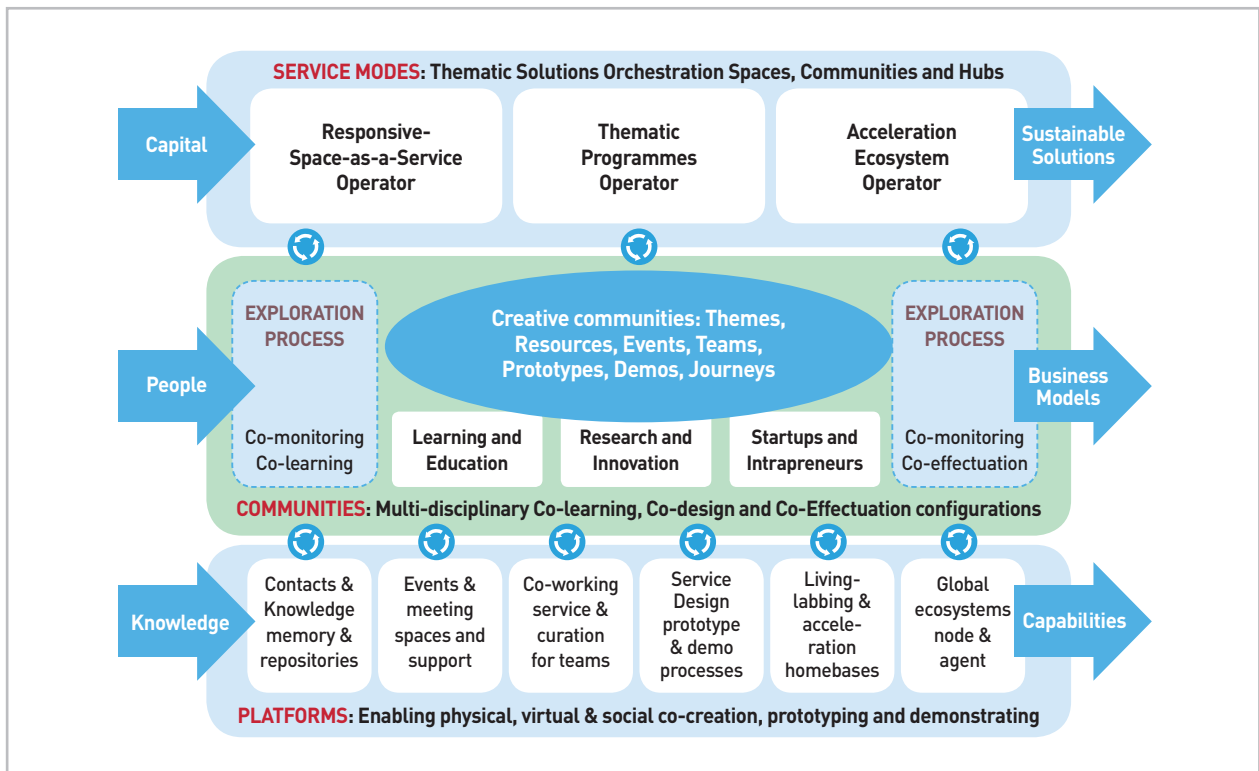


Fig. 3. The platform thinking in 3rd generation science park environment (case Urban Mill Open Innovation Platform, picture Kari Mikkela & Lars Miiikki)

The deeper reason that platforms have lately captured so many business leaders' imaginations is that they enable "pull-based" approaches. In the past, sellers have been limited by the economics of scale thinking in production and distribution, meaning that they simply made an efficient batch size of what they sold and delivered it to the marketplace. A push-based approach is very efficient if the forecast is accurate—and can at least be profitable if, failing that, the marketer is able to alter demand with its pricing and advertising. But when entering the Postnormal Era, there are too many and too big "ifs."

The best way to adapt to the challenging conditions is offered by the clever use of platforms. Here we want to show an example from Espoo and the picture below explains the creative platform thinking implemented successfully in Urban Mill case study. The platform elements are illustrated on the lower level and even though they don't use the same terminology as this paper, the main operational elements are presented. The competence platform is not clearly shown in the figure, but is practically an overlapping layer, in which the physical space and the orchestration are in elementary role.

The most valuable part for the STP context is the Urban Mill's Solution Orchestration business model.

On the Services level the model combines three logically different operator roles: 1) Space-as-a-Service Operator (responsive, flexible and tailored space solutions for innovation communities), 2) Innovation-Community-as-a-Service Operator (engaging, aggregating, curating and uplifting innovator teams, and their networks) and 3) Pull-Ecosystem-as-a-Service Operator (co-created and co-generated solutions for wicked urban problems solved by through Urban Mill distributed competence and capability communities). Urban Mill configures its own and its networked resources wisely and thus effectively orchestrates co-creation of sustainable solutions for its partners and customers.

On the Communities level Urban Mill acts in three modes. In the Community exploration mode it continuously monitors locally, nationally and globally new actors and their activities on Urban Innovation focus area. In the Thematic programming mode Urban Mill attracts learning and education, research and innovation, and startups and intrapreneurs to its pioneering community. In the Exploitation mode it helps its community members to start to deliver their offerings to their customers and promote their capabilities to their respective markets. Urban Mill has attracted over 1000 pioneers to start activities on its platform. These pioneers co-create new business models for different Urban Mill's activity domains. The

community brings together people from different backgrounds and enables its members to transform their capabilities to new business models.

On the Platforms level Urban Mill serves with 6 different platform strategies. The platform itself is a resource attractor for individuals and teams. Firstly it is a thematic Contacts and Knowledge hotspot, secondly a Sharing and Learning events forum, thirdly a Creative Knowledge work enabler and supporter, fourthly a prototyping and demoing environment arena, fifthly access provider for real-life testing and livinglab environments, and finally an thematic ecosystem node operators and agent. The platform has a memory and enabling processes, which enable its users to transform available knowledge to capabilities.

The most engaging platforms are designed to follow pull principle. John Hagel, a distinguished business thinker, describes the power of pull platforms as below. This is an interesting advice because it can be applied to the competence platform design within STP environments as well (Hagel, 2015):

In pull platforms, the modules are designed loosely coupled with interfaces that help users to understand what the module contains and how it can be accessed. Because of this loosely coupled modular design, pull platforms can accommodate a much larger number of diverse participants. In fact, pull platforms tend to have increasing returns dynamics – the more participants and modules the platform can attract the more valuable the platform becomes.

Pull platforms tend to allow us to perform the following activities, with a blurring of the boundaries between creation and use:

- 1) Find
- 2) Connect
- 3) Innovate
- 4) Reflect

For the STP environment a fully working competence platform (a hybrid model with physical and virtual elements) enables the extension of its ecosystem. A platform with enough attraction will create pull that attracts participants to the platform with a kind of social gravity. Platform builders must pay attention to the design of incentives, reputation systems, and pricing models. They must also leverage social media to harness the network effect for rapid growth. For the cohesion

purposes both the bonding and identity factors must be included. Within a STP environment an ideal competence platform can provide a number of benefits:

- It allows the participants / users to architect incentives that repeatedly pull new participants to the platform,
- It provides a central infrastructure on which participants can create and exchange value,
- It helps to match the participants with each other and with content/good/services created on the platform,
- It enables new and unique combinations of competences
- It helps to get connections to the global talent pool

9. CASE STUDY: URBAN MILL

Urban Mill was described in the 2013 UNESCO-WTA International Training Workshop paper, "The Fundamentals of Third Generation Science Park Concept" by Ilkka Kakko, as an example of an emergent innovation platform. At that time the implementation of the concept was in full flow and the founders and the core team had plenty of new elements and practises on their "drawing board". Now it is both inspiring and instructive to check the current situation of Urban Mill development.

Kari Mikkilä, the co-founder of Urban Mill, described the creation and the on-going development phase three years ago:

"Urban Mill is a facilitated innovation journey, where the collaborative actions and creative dialogue between different Urban Mill actors is boosted and facilitated by using physical, virtual and social boundary objects, like shared concepts, methods, probes, prototypes, demonstrations, test-beds and living labs. Joint development work is guided by a co-created broad vision rather than by strictly pre-planned processes. Urban Mill is not only a platform for coming together, rather it is a venue to re-transform, co-align and channel its users objectives, knowledge, practices and expected development outcomes for fitting better to the future urban life."

We can now say that three years of hard work and commitment have taken Urban Mill quite a long way. The co-creation process of the concept can today proudly be seen to have been validated by the many ideas and plans that have now been implemented. (You have to walk your talk!). Urban Mill

is now a fundamental element of Espoo Innovation Garden, which is one of the best working pilots of the 3GSP concept so far.

Urban Mill is known nowadays as a space, community and service, a dynamic global actor within urban development. The people in Urban Mill like to call the space as "Co-working and Co-creation Platform Prototype for Urban Innovations – Entrepreneurial Thought in Action".

The role of Urban Mill at this stage of its life cycle can be highlighted in three areas:

- Method of transformation for its stakeholders
- Focal point for developers and user communities
- Physical and virtual co-creation and development platform

The results of the startup phase are impressive. By the summer of 2016, almost 100,000 people had been engaged physically or digitally with Urban Mill services and over 1,000 urban innovation pioneers had contributed to Urban Mill's co-creation activities through over 2500 registered events, encountering of over 500 organizations, with more than 100 implemented prototypes and experiments, and more than 50 startup teams which have worked at Urban Mill. Nearly 10,000 national and global visitors have been introduced to the concept by personalized presentations and more than 2000 individuals follow its activities continually in the social media.

In 2014 after two years of intensive pivoting and co-creation the Urban Mill's support concept was streamlined and named as Urban Wheel® – Innovation Accelerator Process. The Figure 4 describes how the activities are linked and how the process always is based on both "Doing" and "Learning".

The attraction of people is created mainly by interesting events and stories. This engagement and learning phase has proved to be the key element in creating gravity for the platform. Meaningful thematic contents and shared contexts attract people together, but also the serendipitous bonding principle is strongly present, namely that people are motivated to join because of other trusted community members are attending the same event. So both identity and bonding principles of team building are activated, which is something, which the traditional Triple Helix model is not able to provide. The diversity has proved to become wider, the interaction level more densified and learning is deepened by wide spectrum of complementary disciplines outside personal comfort zones.

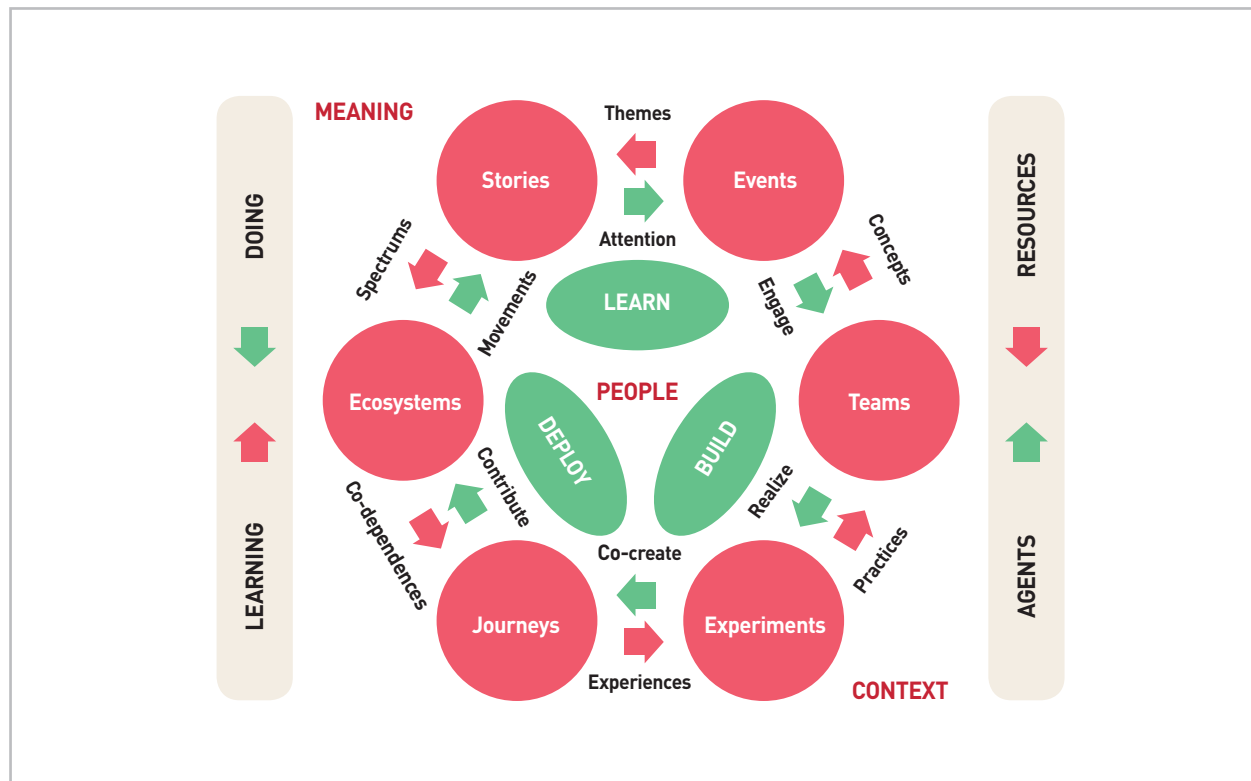


Fig. 4. Urban Wheel © – Innovation Acceleration Process

The main principles of Urban Wheel Process can be summed up in six factors: 1) Sustainable ecosystems – focus in systemic multi-stakeholder benefits, 2) Long lasting collaborative development journeys – focus in strategic resilience, 3) Agile piloting and impact in customer cases – focus in the ability to pivot, 4) Diverse and multidisciplinary teams – focus in team dynamics, 5) The flow of open events – focus in serendipity and cross-pollination, and 6) The inspiring story telling – focus in 'sticky knowledge'.

The following three business cases, supported by Urban Mill during its own business model pivoting phase, expose the role of the platform activities. Urban Mill has enabled co-learning of community members, facilitated their business model pivoting and sped up their ecosystem role search.

Cases represent pre-startup, startup and business scaling phases:

Case Stories & Events: In Summer 2015 two young "makers" from Nepal and from Finland joined Urban Mill community. They love to develop and build new technologies and had acquired a large industrial robot with the plan to configure it

into a huge open source 3D printer. Within the first few weeks they met tens of new people from Urban Mill's research, business and user communities, which kicked off a process of fast learning and rethinking of their development aims. Their business model concepts were pivoted several times, by e.g. pilot customers from the Urban Mill Ecosystem. A company was formed and this Mehta Heino Industries Oy now targets to European and Asian markets with low-cost, high-quality 3D printers, 3D printing offerings and respective training services. The team will release their first batch of their own 3D printers in 2016. (<http://mehtaheino.com/>)

Case Teams & Experiments: Team Hefio joined Urban Mill community soon after establishing their company. The company was kicked off in 2014 by a team of professional acoustic researchers. Hefio Oy is developing technology for self-calibrating headphones and other hearing devices for individually optimized sound. The technology is based on experience acquired through 20 years of research in hearing and audio signal processing, e.g. in Aalto University. The team started as a co-working member of Urban Mill and their idea

was after the design phase to start their production in a lower-cost country. Thus the platform provided them with support services and complementary partners within the Urban Mill ecosystem, and they changed their plans. They co-established a joint production shop with Mehta Heino Industries and some other community members inside of Urban Mill. The production stayed in Finland and thus they were able to launch their first product already in Spring 2016 targeting with it to the high-end users. (<http://www.hefio.com/>)

Case Journeys & Ecosystems: Consair Oy's business idea grew from a problem, which a chemistry student faced in 2011 when working at a construction site. Mortar dust is highly unhealthy and long-term exposure to it causes serious respiratory diseases, but there were no means to handle the dust problem at his workplace. He collected a team and started to generate solutions to the problem. The work leaped really in 2012 when a technology student from Aalto Ventures Programme joined the team and they were able to make new prototypes at Aalto Design Factory. In 2013 the team arrived at Urban Mill for a couple of weeks for dust testing session, and continued using Urban Mill's flexible spaces for R&D work, prototyping, production, assembly, storage and promotion purposes. Urban Mill introduced the team and its product to its own business ecosystem and media connections. First products were sold and used within that construction industry ecosystem. The team learned from experiences of early customers and changed their business model from a product sale to a leasing service model. The company is now an active actor in the Finnish construction ecosystem, a member of Urban Mill Networks, and receives help through it, e.g. for finding scalable production facilities for its growing business and for promotion of their services. <http://www.consair.fi/>

The most recent experiences of Espoo Innovation Garden development are also well described in a white paper published in September 2016 by the EU Committee of Regions: "Regional Innovation Ecosystems - Learning from EU's Regions and Cities". (European Union, 2016)

Many of the key characteristics of platform thinking are embedded in the Urban Wheel process. Because the Urban Mill's service offering - during its present development phase - is thematically widely focused on urban innovations, and the ambience and the flexibility plus certain kind of 'roughness' of the environment Urban Mill has attracted agents and events from very diverse and mutually complementary contexts. The list is impressive:

- Energizing Urban Ecosystems (EUE) Consortia's Industrial

- R&D&I workshops (30+),
- City of Espoo's cross-functional operational teams and coordination boards meetings (continuously),
- Regional City planning workshops (4-8 yearly) for Otaniemi Campus area (Espoo, Aalto, industry, citizens),
- Recurring City Planning and Gaming Recruiting Events (up to 400 participants),
- EU Committee of Regions (CoR) Innovation Seminars (up to 200 participants),
- Architectural Master Courses (24/7 co-working for 3-5 months: e.g. Kigali City Planning (Rwanda) & Modular Home Concepts for Toyota Home (Japan)),
- Inter-disciplinary Creative Sustainability Master Courses (1-4 weeks/year) by Aalto University,
- EU Open Innovation 2.0 workshops (global participants),
- Lean LaunchPad Startup Courses (created by Stanford University) by Aalto Centre for Entrepreneurship (ACE),
- South Korean Startup Summer Camps (4 weeks 2015 and 2016),
- RCA - Royal College of Arts (London) & Aalto University ARTS (Espoo) School-as-a-Service Booth Camps, co-design processes for the City of Espoo (one week 2014 & 2015),
- Both private and public Urban Innovation Hackathons (normally 2-3 days) for Baltic region developer teams,
- Product Design Galas (400-600 visitors once a year) by PDP project at Aalto Design Factory,
- Open Innovation and Maker Days for Citizens of Espoo (200+ visitors, yearly Espoo Day events),
- European Institute of Innovation and Technology (EIT) – challenge cases and acceleration events
- Re-union events of different Aalto Alumni and National Engineering societies,
- Regular Community Breakfasts and Info Events,
- Strategic and operational collaboration workshops of six biggest Finnish cities in Finland (6Aika Cities Consortium)
- Promotional hosting of Espoo Innovation Garden's international visitors groups (EU Institutions; Foreign Embassies, Parliament members from different countries),
- Policy co-creation workshops for Prime Ministers' Office of Finland and for other different public actors,
- Semi-open company events focused mainly on RDI community engagement,
- Thematic professional and societal associations (several) home base activities,
- Espoo Mini Maker Faire, first in Finland and
- Uusimaa Region Innovation Fair, first on the region.

The role of these diverse events is vital in building the ecosystem. Many of the best developments and impactful results have their seeds in the serendipitous encounters that happen in these event settings. Team building is mostly orchestrated by the founders of Urban Mill (who call themselves as 'orchestrators'), but recently peer-to-peer orchestration is also gaining momentum. This is clear evidence that the community building has reached a stage where a vibrant core tribe of 'urbanmillers' is becoming active and engaged. The layout and flexibility of the physical space and the meanings embedded in the boundary objects became part of the winning formula in this respect.

Urban Mill is at the moment going through the "proof of the concept" phase. The action is still mainly local, although the members of various Urban Mill communities are from international backgrounds. That might be the reason why there has been so far no implementation for a virtual competence platform. Team building and idea elaboration are based on physical presence with the help of social media channels like Facebook, LinkedIn and Twitter. The QR-codes and Google tools are also in everyday use. The orchestrators think that the need for a well working competence platform will appear as soon as Urban Mill takes the next step in their concept development. The scaling up of the concept will add new locations, which are geographically dispersed, and then there will be an urgent need for a platform where global competencies can be shared and new combinations created.

10. CASE STUDY: MEETBERLAGE

Meetberlage is a downtown location in the large European metropolis Amsterdam. The company is located in a beautiful old building, which is well known by locals as a former warehouse and office of Dutch harbour officials. The renovation of the building and the interior design was carefully conducted so that the original atmosphere of an old market place was restored. In fact, when first entering the space, you realize it is a real Agora, with an ambience that you experience with pleasure.

Meetberlage was founded in 2011 and is one of the biggest locations of Seats2Meet, a global chain of co-working and meeting places. Therefore it is natural that Meetberlage phi-

losophy highlights the Society 3.0 thinking, (van den Hoff, 2014) which was introduced by Ronald van den Hoff also known as the Founder of Seats2Meet organization. The business model is based on 'social capital', and the operational principles follow the Mesh. The social capital and the Mesh are described in more detail in Sebastian Olma's book "Serendipity Machine - a Disruptive Business Model for Society 3.0" (Olma, 2012).

The Mesh is a term used by Seats2Meet people and has very interesting overlapping characteristics with our platform thinking. The Meetberlage case study has proven that combining the physical competence platform with a state-of-the-art virtual platform (in this case Seats2Connect) will create a nearly perfect ecosystem for a diverse business community. Our understanding is that the Mesh overlaps in many important aspects with competence platform thinking. Here is how Sebastian describes the platform principles within Seats2Meet environment:

There can be no doubt that Seats2meet.com's logic of presumption⁴ is one of its great attractions. Gerhard Schulze, Joe Pine's sociologist counterpart and the author of "Erlebnisgesellschaft" has pointed out to the fact that today people expect their work environments to provide them with "meaningful experiences" Such experiences provide feelings of belonging and contribution – not necessarily to an organizational structure but to various open value networks. Seats2meet.com has become a platform for new kinds of value networks that together are co-creating a new economic playing field. At Seats2meet.com, they call it "the mesh": a constellation of networks of professionals forming dynamic collective intelligence to which everyone contributes meaningfully in his or her own way. The mesh dynamically connects networks, raising their capacity exponentially. This is not your relatively static Facebook or LinkedIn group; people come and go all the time: networks connect, disconnect and reconnect. Yet the mesh as an ecosphere remains intrinsically stable: it evolves, and this is the condition for its survival.

Meetberlage attracts a variety of people because of its central downtown location. Compared to Urban Mill they have more active free-lancers and established companies and not so

⁴ presumption = production + consumption

many students and early stage entrepreneurs. The ambience in Meetberlage is more local than in Urban Mill, although very metropolitan. The global element in Meetberlage provided by the Seat2Connect virtual platform. In Urban Mill this virtual element is missing and the global connectivity is mainly dependent upon large numbers of international visitors and foreign students.

Even though the essential elements of platform thinking are embedded at Meetberlage, they have realized, that the participation of larger companies could be improved. Just recently Meetberlage has co-created a promising initiative called Solution Society⁵ in which they collaborate with some big institutions in order to build the vital gravity for attraction. Sebastian Olma explains that the Mesh will be a necessary condition for future value creation with larger companies, when he finishes his chapter with an insightful remark:

The crucial condition for a functioning mesh is authenticity, making it hard to achieve with corporations. Only if the sense of belonging and contributing is genuine will a third space emerge where co-consumers are happy to be co-producers as well.

Big institutions and corporations need so-called 'intrapreneurs' (Kakko, 2014a), a new tribe of employees with entrepreneurial spirit and flexible schedules. They might have enough authenticity to become trusted members of Mesh-communities and hence help their corporations to connect to the dynamics of the Meetberlage ecosystem.

The Founder of Meetberlage, Felix Lepoutre, explained in an interview the benefits of belonging to the global chain:

“First of all, in S2M you'll find a group of entrepreneurs all over the world who are connected through a shared vision, and help with the constant updating and changing of this vision. Together we are building many platforms that facilitate the world that's mentioned in this vision, and are always piloting and testing out improvements in the actual outcome of the vision. Decentralised communication between these operators of platforms makes it easy to improve all platforms as one platform in the network improves itself. Also, there's a lot of specific knowledge and experience needed to set up a proper Seats-

2meet platform, and a constant reminder of the vision and experiences in the past. This is always available in the eco-system.

Secondly, the name Seats2meet.com attracts people who understand the society3.0 vision, and who have an urge to live in that society. These people are perfect customers since they are willing to help build this society, and are eager to use the platforms (seats2meet) where it's being built together.

Thirdly, Seats2meet.com facilitates great software that's needed to build and run these platforms. They offer it at a great price, and for some parts even on a revenue-share basis, sharing the risk with the entrepreneurs who build the platforms locally. Since the software is an outcome of the vision, and input on the vision from operators is always accepted and discussed, the software always matches our every need.

The operational tasks on global level are mostly organized by the virtual platform Seat2Connect. Felix has a clear vision about the importance of such service. He continues to explain the benefits:

“I always look at it as a toolkit for operators. Where operators facilitate the physical platforms that are needed to build and connect society3.0, they are great at connecting people. Hence the name 'operator', that comes from a telephone operator. They make sure there are plenty of unexpected and relevant encounters on the platforms. The virtual equivalent of this is S2M Connect. It not only helps the operators in bringing a great overview of the competences that are available for connections, it also enables the users to connect by themselves and make the life of an operator easier. Lastly the artificial intelligence behind the platform functions as an operator in it, stimulating more and more serendipitous encounters.

The concrete output of this is facilitated by chats, questions to the network, meets (meet for a cup of coffee), handshakes (a sort of like), and of course many offline encounters after someone looked at the different people and competencies in or near the place they are in.

⁵ <http://solutionsociety.nl/>

11. CASE STUDY: VIRTUAL COMPETENCE PLATFORMS

The market of virtual competence platforms is evolving in an ever-increasing speed. Since Ilkka Kakko's article about Platform economy was published in LinkedIn on November 2014, quite a few development teams, which either have an ongoing project or are planning to start a project in this area, have approached us. Active communication with these teams has helped us to increase our understanding of the current status of global competence platform market.

The variety of ongoing competence platform initiatives is high, but roughly they can be categorized in three classes:

- 1) Purely commercial products with invitation only
- 2) Open, low-entry projects for commercial usage (with or without a paid upgrading option)
- 3) Open, low-entry projects for mainly social entrepreneurs and impact projects

The teams working on these projects are in most cases pretty small with limited resources, so pivoting and launching new features will take time. The ambition level is generally not very high; the only exceptions in these five cases presented here are Part Up and Seats2Connect.

Unfortunately we have no chance to analyze all of them in more detail in the scope of this article, but we will anyhow give a short overview and links to their web pages. Anyone interested in these initiatives can study these for their own purposes. As it has been said, the variety is high and to find the best option needs some background work in each case.

Part-Up (<http://www.part-up.com/>) is a new initiative with great potential. They seem to have a high ambition level and have put together a good and inspired team. We have had many discussions with the team and their approach and service is impressive. The company surely will make some progress in the near future. They just have found some momentum in Netherlands and the track record and the references they have gained in a very short time since the launch in September 2015 are promising. Now (in March 2016) they have already more than thirty companies as customers and the total amount of participants already exceeds two thousand.

Skillhive (<https://skillhive.com/#>) is a Finnish service, which has been in the market for some years. It was originally designed for the use of HR departments in medium sized and big corporations. It has many of the features of an ideal com-

petence platform and we have our own user experience of it. The design is based on swarms, which can be categorized on different types (ideas, projects, trainings etc.). People can be invited or they can find the interesting swarms for themselves or on someone else's recommendation. The service also a clever LinkedIn API, and the competences in LinkedIn profiles can automatically be uploaded to the user profile. The other extremely useful feature is that they list not only competences ('skills') but also the motivational factors ('wills'). This feature helps in a brilliant way the mentoring process within the platform.

Skillhive could be a good option to have as a foundation for anyone interested in competence platform development. The management team in the company behind the service (Intunex Ltd) is pretty conservative and so far they have focused on potential customers in the HR field. If they decide to acquire more resources and focus future development in the direction of global competence platform, then this could be a great service for 3rd generation science park environments as well.

Seat2MeetConnect (<http://connect.seats2meet.com/>) is a platform used by Seat2Meet customers globally. They have the benefit of having a large community already using their physical premises all over the world. The management team in Seats2Meet have in recent months really discovered the huge potential in the global competence platform development. They have even revised their strategy and today they are offering their competence platform service as the main attraction to join the global chain. They have many creative and inspiring elements as described in the context of Meetberlage case study. The development work is properly resourced, and the team also has two algorithm experts to design some 'serendipitous' elements for the service. The new version is still under development so that there is currently no chance to give any user evaluation of the service. The expectations are high and they have all the elements to be successful in the future.

Focal Shift (<http://focal-shift.org/>) is a new initiative based on Australian-US collaboration. Their focus is on the social entrepreneurship market and we have followed their development pretty closely. The team is small and so far they have operated with very limited resources. Focal Shift launched last year a crowdfunding campaign in order to speed up their development. If you are interested, you can join here: <http://www.gofundme.com/focalshift>

Babele (<http://babele.co/>) is a more established solution for social entrepreneurs. They have been on the market for a

while and their service has already quite good numbers of participants. They have also a well thought-through structure in their service and even a business model canvas by Alex Osterwald is embedded.

12. CONCLUSION

We are entering the Postnormal Era with VUCA (volatile, uncertain, complex, ambiguous) conditions. The tools and theories that were held during the Industrial Age are no more valid in this STP context. New approaches and ways of thinking are urgently needed, and this highlights the challenges, which STPs are also facing.

The rapid transformation of our business environment has resulted in radical changes in the innovation system. The once dominant STP organization in Finland Technopolis Plc. has revised its strategy, narrowed down its role in the Triple Helix environment and given up all incubation and development programs. This made space to a new infrastructure to emerge. Within Espoo Innovation Garden, small and entirely new innovation entities have developed an infrastructure with elements close to 3rd generation science park concept (3GSP). The entire Espoo Innovation Garden ecosystem evolves continuously, and the development process is supported by the co-creation and open innovation principles. Pull approach and platform thinking are widely used and the practical experiences and impact created within Urban Mill ecosystem are really encouraging and adaptable also in the global STP scene.

Platform thinking has proven to be successful in conditions where predictability and stability are replaced with uncertainty and complexity. Many industries are already disrupted; new players with superior business models are entering the field. This will soon happen also in the innovation intermediary industry, as the once successful Triple Helix model becomes quickly outdated. It will be replaced with more dynamic and engaging models where co-creation, open innovation and serendipity management are the main drivers. Platform thinking provides solutions in the form of physical and virtual competence platforms, where the interaction is peer-to-peer driven, self-organized, and in best cases can catalyse movements. The role of gatekeepers and brokers, once so important in Triple Helix model, is replaced by innovation gardeners and platform facilitators. This is clearly proved by the rapid success of new entities within Espoo Innovation Garden.

The traditional locations of STPs in university campus areas will be challenged by physical platforms in downtown locations in metropolitan areas. Meetberlage in Amsterdam is a perfect example of this development. The blurring of work-life balance in freelancer and start-up communities is changing our understanding of the hours we consider as 'work'. Downtown locations are much more accessible and provide so much more buzz and vivid ambience than campus areas. Urban Mill is fighting this trend with the help of the entire Espoo Innovation Garden master plan for campus development and a new and fast metro-connection to downtown Helsinki.

Virtual competence platforms are developing quickly and will play a significant role in the future. We listed some of the better-known and promising developments in this area and explained our experiences when using one of them in the customer project. In the competence platform market the winners will be those service providers, who offer low entry platforms with massive gravity. The attraction of the competence platform comes only from the quality and quantity of the participants. Critical mass is needed and those platform providers, who already have large communities in their ecosystem, will have a huge competitive edge. For the global STP community, as for WTA, platform thinking offers a unique opportunity to scale the operations and build a powerful structure with real impact.

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Received January 15, 2016

Revised March 31, 2016

Accepted May 09, 2016