

## BUSINESS INCUBATION GUIDELINES AND OPEN INNOVATION

Iveta Cirule<sup>1</sup>, Dr.sc.administr., Postdoctoral Researcher

<sup>1</sup>BIORGANIK 5 Ltd.

**Abstract.** Open innovation (OI) is the actual framework for doing innovation. Business incubators are OI places because beyond the office space and other services, they ensure networking and facilitate OI collaborations both inside the incubator among entrepreneurs and outside with external stakeholders. Thus, instead of playing a mere passive role, incubators now facilitate OI for their inhabitants by providing relevant services. The "Business Incubation and Open Innovation ABC" as the guidelines for business incubators are one of intellectual results in the project "Open Innovation, No1.1.1.2/VIAA/3/19/426" funded by Postdoctoral Research Support Aid programme of Latvia. This article identifies the structure of national business incubation (BI) guidelines focusing on BI process through OI approach, namely partners, competences, strategies (inside-out and outside-in), sustainability. The article reveals the incubation and OI trends based on: 1) the literature review and 2) empirical qualitative research. The empirical qualitative research comprised: 1) national business incubation service analyses from OI perspective, 2) the international practice analysis of incubation programmes at Aalto University, Finland, and TalTech in Estonia, based on eight expert interviews, and 3) national business incubation expert and management (23) focus group discussion results. The pandemic facilitated the online co-creation, co-petition, and collaboration in business incubation. Although business incubators reorganized their cycle and services, incubator operators, managers and tenants still lack the overall recognition of OI approach in BI, even though, OI activities are practised.

This article provides national BI guideline's structure as a novelty for business incubation practitioners, academia, entrepreneurship support policy makers and tenants explaining business incubation role, OI practices and strategies applied to business incubation and incubators as OI partners.

**Keywords:** open innovation, business incubation.

**JEL code:** O36, M13

### Introduction

The open innovation (OI) is the actual framework for exploiting external resources and wider networks in doing innovation instead of just operating with in-house resources (Vanhaverbeke et al., 2018). The understanding and application of the concept of open innovation has grown rapidly over the last two decades introducing it into business and organizational management processes as the new normal practices (Cricelli et al., 2016).

While companies are gradually understanding the application of OI strategies in the development of new ideas for product, process, business model and other innovations (Del Vecchio et al., 2018), various business support institutions and intermediaries use this concept as an essential basis for further transition to more open systems or labs accumulating the OI framework to maximise benefits from the established cooperation networks (West et al., 2014).

Business incubators are OI places because beyond space and business consulting services, they offer networking services that facilitate OI collaborations both inside the incubator among entrepreneurs and outside with the incubator's external networks (Claussen and Rasmussen, 2011). Thus, instead of playing a mere passive role, incubators now facilitate OI for their inhabitants by providing relevant services (Gram-Vigouroux and Royer, 2020).

The aim of this research is to investigate the concept of OI in BI and identify the structure of national business incubation (BI) guidelines. Main research tasks are: 1) to investigate concepts of the business incubation and OI, 2) to conduct national and international BI programme analysis from OI perspective, conduct BI expert interviews and focus group discussion; 3) to define national BI guidelines' structure.

This article identifies the structure of national BI guidelines focusing on BI process through OI approach, namely partners, competences, strategies (inside-out and outside-in), sustainability.

To achieve research tasks, the literature review (on BI, OI) and empirical qualitative research was conducted. The content analyses were performed using NgramViewer and VosViewer. The empirical qualitative research methods comprise: 1) national business incubation service analyses from OI perspective, 2) the international practice analysis of incubation programmes at Aalto University, Finland, and TalTech in Estonia, based on eight expert interviews, and 3) national business incubation expert and management (23) focus group discussion results.

The BI Guidelines' structure is proposed based on four main chapters, each chapter providing: 1) theory perspective and 2) practical part – case studies, testimonials, best practice examples, international and national BI programme analysis as well as suggestions for various BI stakeholders – BI practitioners, tenants, academia, policy makers.

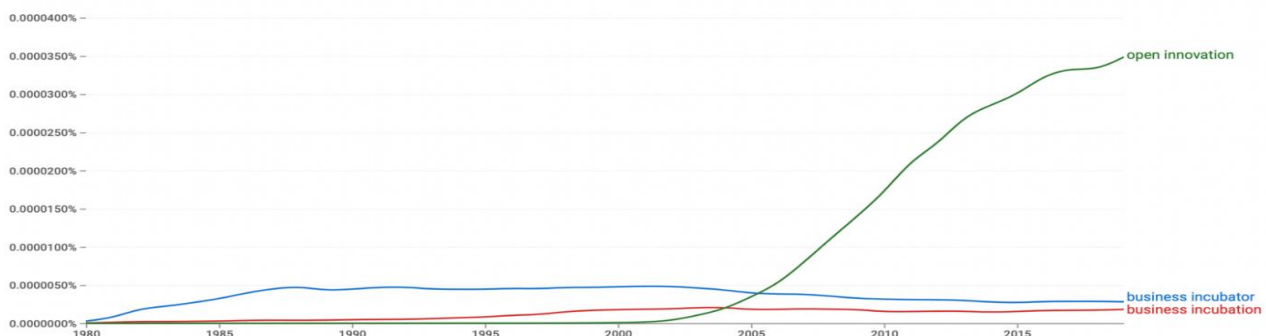
This article provides guideline's structure as a novelty for business incubation practitioners, academia, entrepreneurship support policy makers and tenants explaining business incubation role, process and OI practices and strategies applied to business incubation and incubators as OI partners.

The results of this research revealed that the pandemic facilitated the online co-creation, co-petition, and collaboration in BI. Although business incubators reorganized their cycle and services, incubator operators, managers and tenants still lack the overall recognition of OI approach in BI, even though, OI activities are practised.

### **Theoretical overview of the business incubation and the relation to open innovation**

The literature review reveals the main findings about: 1) the concept of business incubation and growing role of BI in entrepreneurship development; 2) BI services (business consultancy, networking, infrastructure), particularly the growing role of networking services in BI; 3) open innovation in BI, business incubators as OI partners; 4) tenants' ability to perform in OI by possessing OI competences, applying the OI strategies and doing co-creation and collaboration with OI partners; 5) sustainability in business modelling and value creation as a growing general awareness of tenants, and new green course of EU agenda (Green Deal, 2020) and Sustainable Development Goals globally (UNDP, 2020).

Ngram Viewer visualises the analyses of the frequency of key phrases mentioned in the information sources of the google corpus over the specified period (Friginal et al., 2017). The Ngram Viewer analyses verify the topicality of the selected concepts since year 1980 and confirm most active research time periods for the particular concept (Rutitis et al., 2022). The analysis of Ngram Viewer (Fig.1) shows that the popularity of the business incubator and business incubation concepts has been increasing in the literature since the 1980s (Al Ayyash et al., 2020), while the research about the OI has seen a rapid leap in the last 15 years.



**Source: created by the author with Ngram Viewer, 2022**

**Fig. 1. The frequency of using keywords "business incubator", "business incubation", and "open innovation"**

The Ngram Viewer content analyses shows that the general research activity regarding BI and business incubators is decreasing and is being replaced by other innovative support forms for start-ups, like open labs, hackathons and other. OI has been an important topic, which has attracted the interest of scientists and practitioners (West et al., 2014). These initial findings were verified with the content analyses done by VOSviewer. In total 1184 scientific publications were selected from the SCOPUS data base using the phrases business incubator and business incubation (TITLE-ABS-KEY "Business incubator" and "Business incubation"). The content analyses performed by VOSviewer indicates most important research directions and discourses regarding the BI described below.

Entrepreneurship nowadays is a process of OI and start-up companies are "powerful engine of OI processes" (Spender et al., 2017). OI is the new model of doing innovation (Chesbrough, 2003) and it includes specific strategies (such as inside-out and outside-in activities) (Gassmann & Enkel, 2004). In order to use these strategies, nascent entrepreneur needs specific competencies, named OI competencies (Du Chatenier et al., 2010), (Fukugawa, 2013) motivation and partners. Business incubators are among initiatives that stimulate economic growth by facilitating creation of new companies (Ratinho, Harms, & Groen, 2011). Business incubation is regarded as an entrepreneurship development tool for promoting innovation, economic growth and employment generation. The substantial proliferation of business incubators around the world over the last three decades has been paralleled by a growing body of research in this domain (Theodorakopoulos et al., 2014).

Incubation is a support process that nurtures the development of beginning and emerging companies through a range of resources and services. Entrepreneurial process refers to the recognition or creation and exploitation of business opportunities and that requires various types of skills and competencies (Fukugawa, 2013). New business creation is frequently related to innovation and business incubators have unique position of knowledge transfers in this innovation and entrepreneurship ecosystem (Mian et al., 2016). The OI theory addressing the business incubation is popular since 2015. Innovative entrepreneurship process is related to use of OI strategies as for example inflow and outflow activities (Gassmann & Enkel, 2004) and to develop specific competencies, named OI competencies, which are essential for the success of OI (Du Chatenier et al., 2010). As the competencies in general are important for performance (Mitchelmore & Rowley, 2010), those related to OI competencies could help nascent entrepreneurs to exploit better the incubator's services and OI strategies and, thus, influence their success inside the incubator. In the growing context of OI, business incubators adapt by developing more the networking services (Hansen, Chesbrough, & Sull, 2000). The OI theory application to the BI process, OI competences and strategies as well as Sustainability dimension is the theoretical and practical novelty to be included in the national BI guideline structure.

OI competences as described by Eliza Du Chatenier (2010) defines competences as an overview of essential elements of professional competences required for effective performance. Tenants are utilizing BI services, this is important to describe the tenants' ability and motivation in service utilization. Tenants' competences are linked with tenants' innovation ability. Innovation must be understood not only in terms of conventional problem-solving techniques and improvements but also openness, alertness, and sensitivity to new and emerging opportunities (Grama & Royer, 2013). OI competences are grouped in four clusters corresponding to interpersonal management, project management, content management, and self-management.

Business incubators can be classified according to their governance and ownership models, for instance, operating with the private capital, state funded or university business incubators, incubators operating within science and technology parks or within other business acceleration programmes (Grimaldi & Grandi,

2005; Hausberg & Korreck, 2020). Furthermore, business incubators vary depending on thematic focus, for instance, technology incubators (Phillips, 2002), creative incubators (Steinbergs & Cane, 2021) or green business incubators (Bank et al, 2017). Recently, the sustainability or circular transition and the promotion of environment-friendly businesses has become as an important focus for the business incubators (Hull et al., 2021). Sustainability-oriented business incubation is a relatively new and emerging topic (Fichter & Hurrelmann, 2021).

Business incubators usually nurture early stage or newly established ventures, or teams having new business ideas, also named as incubator tenants or incubates (Pukite & Geipele, 2015; Klofsten et al, 2020). Depending on the life cycle of the tenant, the pre-incubation (the business idea development stage), incubation (first early-stage years after the registration of a company) and post-incubation (growth and scale-up stage of the company) can be distinguished. Also, depending on the type of services there are virtual incubators or incubators providing office space and other office infrastructure services, that in latest decade tend to transform into the co-working spaces (Carayannis & Von Zedtwitz, 2005; Fuzi, 2015). The involvement of higher education institutions within the support of student start-ups and university spin-offs (Mathisen & Rasmussen, 2019) is an important research perspective. This is closely related to the concept of university business incubators that has been more actively investigated in last decades under the paradigm of an entrepreneurial university (Bennett et al., 2017; Bikse et al., 2016; Guerrero & Urbano, 2012).

An important research stream covered by the academic community is related to the measurement of the incubators' performance, the incubation impact and the communication about this impact (Hackett & Dilts, 2004). In this respect, incubators measure the number of tenants enrolled within the incubation and their survival rates, but less actively measure and report other impact, for instance, on the financial performance and attraction of the financing, the creation and commercialisation of new products, the scale-up or scale-out of new ventures and their business models (Hausberg & Korreck, 2020). In this respect, besides measuring the performance indicators related to the incubator tenants, Hausberg & Korreck (2020) suggest the evaluation of outcomes achieved by the incubators, like, the funding attracted, specific support initiatives and events adopted or organised, the promotion of the business mindset and the general business awareness facilitated.

Researchers distinguish the impact on the entrepreneurial ecosystem level beyond the boundaries of the business incubator or any its tenant companies (Hausberg & Korreck, 2020). On this ecosystem level it is important that the business incubator is recognised as a valuable contributor to the sustainable regional growth and the well-being of local people by the promotion of the local entrepreneurship, use of local resources and the job creation (EUBIC, 2021). Changes in this level are having the interdisciplinary nature and can also be influenced by other factors, but incubators may only have a mediating role and may depend on the collaboration with other stakeholders.

Researchers agree that promotion of the collaboration and networking is an important part of incubator services, although business incubation programmes not always recognise it as a type of the specific service. The collaboration and networking as a form of a support is highly proposed in the cluster support initiatives (Klimuk & Lazdins, 2019) and gradually being recognised by business incubators (Klofsten et al., 2020). Within business incubators the aspect of the cooperation is more associated with the sharing of knowledge and experience or the possibility to utilise the co-opetition instead of the competition (Bøllingtoft, 2012). A relatively newer approach is to link the networking services to wider possibilities of accessing resources for the innovation, which is largely based on the concept of OI theory (Chesbrough, 2003). Evaluating the evolution of business incubator services, business incubators are distinguished by three generations. The

first generation is linked to the 1980s, the second with the 1990s and the third with the first decades of this century, and the networking only appears as an incubator service in the third generation (Theodorakopoulos et al., 2014). Incubators may engage in network mediation, i.e. matching incubates with other actors, with the purpose of compensating for the incubates lack of established entrepreneurial networks (Peters, Rice, & Sundararajan, 2004).

At present, business incubators are likely to start developing in the fourth generation, where networking and OI form an essential basis for incubator support services. In addition, the COVID-19 pandemic period reinforces the value of OI and collaboration.

The concept of OI offers new strategies and practices for using not only in-house resources in the innovation process, but also to gain knowledge, new ideas and expertise from outside in order to advance in the innovation (outside-in), or to share ideas and knowledge with others (inside-out). Both outside-in and inside-out OI activities contribute to advance in the value creation and capturing (Chesbrough, 2006). OI practice envisages the creation of new knowledge and ideas in the collaboration with other stakeholders, for instance, government organisations, consultants, research centres and universities, customers, society and non-governmental organisations or other private companies considered as the triple, quadruples and Penta helix cooperation (Carayannis et al., 2021; Uvarova et al., 2021). Currently the concept of Living Labs combines OI framework (Lapointe & Guimont, 2015), which should be considered in further development of incubators.

OI requires the specific strategies, such as inside-out and outside-in activities, but also some coupled activities, which suppose a combination of those two (Gassmann & Enkel, 2004).

Outside-in activities are supposed to involve external and internal parties of the business to accelerate internal innovation. Inside-out activities include new ways of commercialising the unused technology and patents. The outbound dimension of OI refers to "earning profits by bringing ideas to market, selling IP, and multiplying technology by transferring ideas to the outside environment". It focuses on external paths to commercialise innovations that have been developed internally (Vanhaverbeke et al. 2018).

Summarizing the main findings from literature review, the conclusions are: 1) business incubators are OI partners providing access to networking and external knowledge; 2) tenants should possess the OI competences and apply relevant strategies to utilize the incubator services; 3) sustainability, both value creation and business conduct, is a growing trend in entrepreneurship and BI.

## **Research methods**

The main aim of research was to validate the findings from literature review or guidelines' theory-based part with empirical practice in BI nationally and internationally.

The empirical qualitative research comprised:

- 1) national business incubation, led by Latvia Investment Development Agency (LIAA), service analyses from OI perspective to detect the OI activities in a current BI programme;
- 2) the international practice analysis of Aalto University (Finland) entrepreneurship and business incubation eco system (in total 5 different organizations) and Tallinn Technical University (Estonia) incubation and entrepreneurship support programmes (in total 3) by expert interviews (8) to identify the international practice and discover the new incubations dimensions;
- 3) national BI expert and management (23) focus group discussion to validate the guideline structure and detect the existing OI practices conducted by tenants nationally.

## **Research results and discussion**

The main qualitative research focus is OI approach detection in BI. The overwhelming research questions: 1) "Is OI present in Latvia business incubation?" with the focus on OI strategies in incubation services and 2) "How to improve national business incubation" with focus on Incubation Guidelines content structure creation.

### **1. The analysis of national business incubators' service offer through open innovation approach**

The state policy to start business incubation was launched at the beginning of 2007 by the Ministry of Economics of Latvia. Investment and Development Agency of Latvia (LIAA) is responsible for business incubation since then. The first public funding scheme was conducted from 2007, the current programme is operating until December 2023. The incubation programmes were undergoing the continuous improvement process. LIAA business incubators provide support for business start-ups and individuals. A project jointly formed by the European Union and the State of Latvia has been implemented since 2016. There are 11 regional business incubators and 9 support units throughout Latvia, as well as the Creative Industry incubator in Riga, which is specialised in providing support to businesses in the creative industries (LIAA, 2021).

Natural persons or start-ups, the territory of which corresponds to the actual activity or legal address (for natural person in pre-incubation or for start-ups in pre-incubation and incubation), may apply to regional incubators. The exception is the Creative Industry incubator located in Riga city, where creative industry companies and business ideas from all over Latvia can come in. This specific requirement for a legal address or business performance in a certain region could be recognized now-a-days as barrier for business incubation, particularly, during pandemic when virtual incubation and also business performance and business model digitalization boosted. Hereby, it is important to mention Finland BI practice based on expert interviews - incubators may be joined online and onsite by Finish nationals and foreigners, not linked to any geographical restriction. By this open-access policy incubators could reach more diverse team composition and also promote intercultural learning.

LIAA incubation is divided into two stages - pre-incubation and incubation. The programme "Regional business incubators and Creative business incubator" national report reveals that the total number of received application for both pre-incubation and incubation support by 31 December 2021 was 4993, approved - 3380, rejected - 1488; pre-incubation services received by 2479 tenants (LIAA, 2022). LIAA current pre-incubation and incubation service provision is including three important service blocks: 1) consultancy, 2) infrastructure and 3) networking. The Table 1 below reveals the LIAA service perspective analysis through OI. Incubators serve as the internal and external network and knowledge providers or important OI partners (Grama-Vigouroux and Royer, 2020).

Table 1

**The analysis of Investment and Development Agency of Latvia business incubation service from open innovation perspective**

<b>Business incubation service type</b>	<b>OI Inside -out (outbound) sharing knowledge</b>	<b>OI Outside-in (inbound) attracting external knowledge</b>	<b>Pre-incubation</b>	<b>Incubation</b>
<b>BUSINESS CONSULTANCY AND TRAINING</b>		X	initial business idea rating	n/a
		X	individual advice and consultancy	consultation of experts and mentors in the sector
		X	Business school training – three days for learning business bases in the management of experienced teachers	in-depth training and seminars
<b>INFRASTRUCTURE</b>	X	X	co-location room and office equipment	open office and office equipment
		X	n/a	30% co-financing for raw materials and raw materials
		X	n/a	50% co-financing for different services and facilities
<b>NETWORKING</b>	X		PINK School – lesson cycle for developing a business idea model with a business incubator team	n/a
		X	getting familiar with the business environment – business experience stories and visits	n/a
	X	X	participation in Latvia's largest new business community	participation in Latvia's largest community of young entrepreneurs
	X	X	n/a	free participation in the joint stand of LAA business incubators in industry fairs, pop-up stalls, etc

**Source: created by the author based on LIAA business incubation service analysis, 2022**

Table 1 reveals the current LIAA services which are promoting the OI outside-in approach as defined by OI researchers. In the current, highly competitive business environment, outside-in OI has become a popular phenomenon (Markovic et al., 2020). Outside-in OI consists of purposefully bringing external knowledge (i.e., insights and ideas of external partners) into internal innovation processes (Vanhaverbeke et al., 2020). Accessing relevant external knowledge, and integrating it internally, is likely to enhance a

firm's innovation outcomes. OI outside-in approach is mainly promoted through business consultancy and infrastructure service, whereas, inside-out approach is observed through networking services, such as: 1) participation in Latvia's largest new business community and 2) free participation in the joint stand of LIAA business incubators in industry fairs, pop-up stalls. This finding corresponds to the crucial role of networking services now-a-days mentioned in the literature review as networking is both knowledge sharing and acquiring. Dominance of OI outside-in approach in LIAA BI programme is beneficial to tenants as they seek new knowledge in innovation process, thus, external partners such as business consultants, mentors, experts, other companies, and external network participants may serve as knowledge and inspiration source.

## **2. The international practice analysis of Aalto University (Finland) and Tallinn Technical University (Estonia) incubation programmes**

The online expert interviews (8) were conducted in March 2022 as a virtual postdoctoral research mobility. The above-mentioned Universities were selected as these are leading Universities in BI in Baltic countries and at the same time also the cooperation institutions for the author in postdoctoral research since January 2020. The main interview focus - OI approach in BI. How to improve national BI and create Guidelines content structure was important mission of expert interviews.

The following questions were asked: 1) OI approach application to business support and incubation activities; 2) understanding of OI by incubator tenants and nascent entrepreneurs; 3) business incubators' role; 4) suggestions for National BI Guidelines; 5) necessity of OI self-assessment digital tool development to measure entrepreneur and tenant capacity, knowledge and promote collaboration.

The Aalto University eco system is large, international and experienced. Aalto promote student, university and business lead incubation and support services. There are such programmes and initiatives as Urban Tech Helsinki Incubator; StartUp Sauna; Aaltoes or Aalto Entrepreneurship Society; KIUS - the leading start-up accelerator in Finland; Aalto Venture programme promoting sustainability through entrepreneurship (Aalto University, 2022).

Tallinn Technical University is offering Innovation Centre Mektory with different entrepreneurial support activities, e.g. Taltech Deepest Spin-Off Program with an intensive 3-months program for teams or individuals with ideas to move their science-based ideas onward; STARTERTallinn programme advancing entrepreneurship, learning teamwork, developing business ideas, and learning the basics of creating a start-up company; TalTech Mektory Startup Competition helping students from Estonia and abroad interested in creating a start-up; Prototron for prototyping green ideas (TaltTech, 2022).

The main results from expert interviews revealed following findings – firstly, OI approach is applied and utilized in BI but not fully recognized by tenants. Tenants mostly do not interlink the networking, co-creation and collaboration as the OI manifestation. Secondly, a growing popularity of virtual BI due to pandemic is obvious and facilitated the online networking services, online collaboration and external services. All international experts agreed that business incubators play an important role in entrepreneurship promotion and help particularly Universities to become more entrepreneurial. Estonian expert mentioned the crucial role of incubators helping to overcome technology readiness level gap between levels 3 up to 6/7 or in other words help to create and validate prototype. In total 6 experts supported the idea of OI self-assessment digital tool development, but pointing out the main aim of this validation or recognition – this tool could help not only to validate but also learn the OI activities in practice. This suggestion will be validated in Latvia business incubators in May 2022 in order to explain to tenants the OI in action by infographics and short video tutorials. Finally, Finish experts (5) mentioned the importance of



sustainability in terms of business modelling, value creation and building the tenants' long-term mindset which corresponds to the recent findings from literature review by Hausberg & Korreck, 2020. Estonian experts (3) underlined the importance of the legal literacy of tenants in intellectual property rights and technology transfer. The tenant knowledge lack of IPR protection in innovation process could be turned into one more practical building block of Guidelines. These interviews helped the author to understand the BI reality at two international universities offering BI and entrepreneurship support services to national and international teams, thus, serving as the OI partners.

### **3. National business incubation expert and management (23) focus group discussion results**

The focus group with 23 participants from 11 national LIAA incubators were hold on-line in April 2022. The OI approach in BI and OI competences, partners and strategies were presented from theory perspective and previous research in Latvia University business incubators in 2017. The experts (20) agreed that OI outside-in activities offered by LIAA services such as consultation of experts and mentors in the sector and participation in Latvia's largest community of young entrepreneurs are important to tenants as external knowledge attraction activities. Experts also pointed out that LIAA BI services are OI oriented as promote co-creation and collaboration inside team and with external stakeholders or OI partners but these activities are not recognized as OI approach. In Latvia, BI practice OI activities are present but these activities are not named as OI activities. The crucial focus group discussion part was about networking. Experts (15) mentioned that tenants are now-a-days saturated by various networking on-line and onsite events. The lack of time is also important aspect of less active networking as tenants focus mainly on business development, not paying attention to networking due to limited resources (lack of time and social capital).

### **Conclusions and recommendations**

- 1) The analysis of LIAA BI service offers in 11 national incubators revealed the dominant presence of OI outside-in activities, whereas, OI inside-out activities are less present. The national BI experts' (23) focus group discussion about BI content proved the assumption that the OI concept is not directly presented to tenants, even though, the OI activities are present in Latvian national BI. The recommendation for BI managers and tenants is to promote practical OI activities in BI, e.g. directly involve customers in the innovation process; utilize the external creativity and knowledge by directly involving clients in the design, planning and testing and indirectly by using third parties to intercept creativity and knowledge from the Internet; actively participate in others innovation projects etc. The practical activities could encourage tenants to understand the OI nature and co-creation and collaboration benefits.
- 2) The online BI nature facilitated by pandemic time, changed BI scene nationally and internationally as incubators shifted their main services such as business consultancy and networking online. National and international experts concluded that this was a positive change enhancing virtual BI and digitalization. The recommendation for BI practitioners is to maintain this virtual BI trend as this is offering the wider opportunities for tenants to join incubation process online both in Latvia and abroad.

Table 2

**National Business Incubation (BI) Guideline's Structure**

CHAPTER TOPIC	THEORY part	PRACTICAL part
<b>BI historical perspective:</b> from infrastructure to networking	Theodorakopoulos et al., 2014; Hausberg & Korreck, 2020 Steinbergs & Cane, 2021; Bank et al., 2017; Mian , et al., 2016	Batavia (USA) case study
<b>BI services:</b> business consultancy infrastructure networking online BI	Grama-Vigouroux and Royer, 2020; Claussen and Rasmussen, 2011; Peters, et al., 2004; Lapointe & Guimont, 2015; Klofsten et al., 2020	Aalto University and Helsinki city, Finland TalTech (Estonia) National incubators (LIAA, University, technology)
<b>Open Innovation in BI, incubators as OI partners; OI strategies in BI</b> Inside -out strategy Outside-in strategy OI Partners OI Competences	Chesbrough, 2010; Vanhaverbeke et al., 2018; Bøllingtoft, 2012; Du Chatenier, et al., 2010; Fukugawa, 2013 Grama & Royer, 2013 Carayannis et al., 2021; Grama-Vigouroux & Royer, 2020	Aalto University and Helsinki city, Finland TalTech (Estonia) National incubators (LIAA, University, technology)
<b>Sustainability in BI:</b> Value creation Business modelling Helping to reach SDGs	Hull et al., 2021; Del Vecchio et al., 2018; Fichter & Hurrelmann, 2021	Aalto University and Helsinki city, Finland

**Source: created by the author based on literature review and expert interviews, 2022**

3) The Table 2 above provides the overall structure for national BI guidelines, based on the literature review, expert interviews, focus group discussion results. The recommendation is to form four main chapters, providing: 1) theory perspective and 2) practical part. The recommendation for structure is proposing the dimensions: 1) BI historical perspective, focusing on incubator role change from infrastructure to networking; 2) BI services (virtual, networking, business consultancy), focusing on networking as important OI outside - in activity; 3) OI (outside-in knowledge transfer, collaboration, co-creation) and incubators as OI partners; 4) Sustainability (ecological, business model, value creation). Sustainability dimension could serve as a novelty in a national BI. The ecological sustainability is well-recognized in Latvia, on contrary, the sustainable business modelling and value creation is a brand-new approach attracting the attention of those tenants representing mainly the Generation Z.

**Acknowledgements**

This research was conducted within the project "Open Innovation, No1.1.1.2/VIAA/3/19/426" funded by Postdoctoral Research Support Aid programme of Latvia.

**Bibliography**

1. *Aalto University* (2022). Retrieved: <https://www.aalto.fi/en>. Access: 20.03.2022.
2. Al Ayyash, S., McAdam, M., & O'Gorman, C. (2020). Towards a New Perspective on the Heterogeneity of Business Incubator-Incubation Definitions. *IEEE Transactions on Engineering Management*. pp.1-15.
3. Bank, N., Fichter, K., & Klofsten, M. (2017). Sustainability-profiled Incubators and Securing the Inflow of Tenants–The Case of Green Garage Berlin. *Journal of Cleaner Production*, No 157, pp. 76-83.

4. Bennett, D., Yábar, D. P. B., & Saura, J. R. (2017). University Incubators May Be Socially Valuable, but how Effective are They? A Case Study on Business Incubators at Universities. In *Entrepreneurial Universities*. Springer, Cham. pp. 165-177.
5. Bikse, V., Lusena-Ezera, I., Rivza, B., & Volkova, T. (2016). The Transformation of Traditional Universities into Entrepreneurial Universities to ensure Sustainable Higher Education. *Journal of Teacher Education for Sustainability*, Volume 18, Issue 2, p.75.
6. Bøllingtoft, A. (2012). The Bottom-up Business Incubator: Leverage to Networking and Cooperation Practices in a Self-generated, Entrepreneurial-enabled Environment. *Technovation*, Volume 32, Issue 5, pp. 304-315.
7. Carayannis, E. G., & Von Zedtwitz, M. (2005). Architecting GloCal (global-local), Real-virtual Incubator Networks (G-RVINS) as Catalysts and Accelerators of Entrepreneurship in Transitioning and Developing Economies: Lessons Learned and Best Practices from Current Development and Business Incubation Practices. *Technovation*, Volume 25, Issue 2, pp. 95-110.
8. Carayannis, E. G., Campbell, D. F., & Grigoroudis, E. (2021). Helix Trilogy: The Triple, Quadruple, and Quintuple Innovation Helices from a Theory, Policy, and Practice Set of Perspectives. *Journal of the Knowledge Economy*, pp. 1-30.
9. Chesbrough, H. (2003). The Logic of Open Innovation: Managing Intellectual Property. *California management review*, Volume 45, Issue 3, pp. 33-58.
10. Chesbrough, H. W. (2006). The Era of Open Innovation. *Managing Innovation and Change*, Volume 127, Issue 3, pp. 34-41.
11. Clausen, T., & Rasmussen, E. (2011). Open Innovation Policy through Intermediaries: the Industry Incubator Programme in Norway. *Technology Analysis & Strategic Management*, Volume 23, Issue 1, pp. 75-85.
12. Cricelli, L., Greco, M., & Grimaldi, M. (2016). Assessing the open innovation trends by means of the Eurostat Community Innovation Survey. *International Journal of Innovation Management*, Volume 20, Issue 3, 1650039.
13. Del Vecchio, P., Di Minin, A., Petruzzelli, A. M., Panniello, U., & Pirri, S. (2018). Big Data for Open Innovation in SMEs and Large Corporations: Trends, Opportunities, and Challenges. *Creativity and Innovation Management*, Volume 27, Issue 1, pp. 6-22.
14. Du Chatenier, E. et al. (2010). Identification of Competencies for Professionals in Open Innovation Teams. *R&D Management*, Volume 40, Issue 3, pp. 271-280.
15. EUBIC (2022). Solutions. High Quality Business Support. European Business and Innovation Centre Network. Retrieved: <https://ebn.eu/solutions/>. Access: 01.03.2022.
16. Europe Green Deal Agenda (2022). Retrieved: [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en). Access: 10.03.2022.
17. Friginal, E., Walker, M., & Randall, J. B. (2014). Exploring Mega-Corpora: Google Ngram Viewer and the Corpus of Historical American English. *EuroAmerican Journal of Applied Linguistics and Languages*, Volume 1, Issue 1, pp. 48-68.
18. Fichter, K., & Hurrelmann, K. (2021). Sustainability-oriented Business Incubation: Framing and Supporting Sustainable Entrepreneurship. In *Handbook of Research on Business and Technology Incubation and Acceleration*. Edward Elgar Publishing. pp. 478-495.
19. Fukugawa, N. (2013). Which Factors Do Affect Success of business Incubators. *Journal of Advanced Management Science*, Volume 1, Issue 1, pp. 71-74.
20. Fuzi, A. (2015). Co-working Spaces for Promoting Entrepreneurship in Sparse Regions: the Case of South Wales. *Regional studies, regional science*, Volume 2, Issue 1, pp. 462-469.
21. Gassmann, O. & Enkel, E. (2004). Towards a Theory of Open Innovation: Three Core Process Archetypes. *R&D Management Conference (RADMA)*, Lisbon.
22. Guerrero, M., & Urbano, D. (2012). The Development of an Entrepreneurial University. *The Journal of Technology Transfer*, Volume 37, Issue 1, pp.43-74.
23. Grama, S. & Royer, I. (2013). Competencies for Open Innovation for Entrepreneurs in Technological Incubators: an Empirical Test in Romania. *Revue de l'Entrepreneuriat*, Volume 12, Issue 1, pp. 33-58.
24. Grama-Vigouroux, S., & Royer, I. (2020). Impact of Stakeholders and Collaborative Innovation on Value Creation of Incubated Start-ups: The Case of Romanian Business Incubators. *Innovations*, No 2, pp.129-160.
25. Grimaldi, R., & Grandi, A. (2005). Business Incubators and New Venture Creation: an Assessment of Incubating Models. *Technovation*, Volume 25, Issue 2, pp. 111-121.
26. Hackett, S. M., & Dilts, D. M. (2004). A Systematic Review of Business Incubation Research. *Journal of Technology Transfer*, No 29, pp. 55-82.
27. Hansen, M., Chesbrough, H. & Sull, D. (2000). Networked incubators: Hothouses of the New Economy. *Harvard Business Review*, Volume 78, Issue 5, pp. 74-84.
28. Hausberg, J. P., & Korreck, S. (2020). Business Incubators and Accelerators: a Co-citation Analysis-based, Systematic Literature Review. *Journal of Technology Transfer*, Volume 45, Issue 1, pp. 39 - 63.
29. Hull, C. E., Millette, S., & Williams, E. (2021). Challenges and Opportunities in Building Circular-Economy Incubators: Stakeholder Perspectives in Trinidad and Tobago. *Journal of Cleaner Production*, No 296, 126412.
30. Klimuk, V. V., & Lazdins, A. (2019) . Interaction of Education, Science and Business in Terms of Digital Economy Development. In *Economic Science for Rural Development Conference Proceedings*, No 52, pp. 37-44.
31. Klofsten, M., Lundmark, E., Wennberg, K., & Bank, N. (2020). Incubator specialization and size: Divergent paths towards operational scale. *Technological Forecasting and Social Change*, No 151, 119821.

32. Latvia Investment Development Agency (2022). Retrieved: <https://www.liaa.gov.lv/lv/programmas/biznesa-inkubatori>, Access: 25.04.2022.
33. Lapointe, D. and Guimont, D. (2015). Open Innovation Practices Adopted by Private Stakeholders: Perspectives for Living Labs, Vol. 17 No. 4, pp. 67-80.
34. Mathisen, M. T., & Rasmussen, E. (2019). The Development, Growth, and Performance of University Spin-offs: A Critical Review. *The Journal of Technology Transfer*, Volume 44, Issue 6, pp. 1891-1938.
35. Markovic, S., Bagherzadeh, M., Dubiel, A., Cheng, J., & Vanhaverbeke, W. (2020). Do not miss the Boat to Outside-in Open Innovation: Enable Your Employees. *Industrial Marketing Management*, No 91, pp. 152-161.
36. Mian, S., Lamine, W. & Fayolle, A. (2016). Technology Business Incubation: An Overview of the State of Knowledge. *Technovation*, Volume 50, Issue 51, pp. 1-12.
37. Mitchelmore, S. & Rowley, G. (2010). Entrepreneurial Competencies: a Literature Review and Development Agenda. *International Journal of Entrepreneurial Behaviour & Research*, Volume 16, Issue 2, pp. 92-111.
38. Peters, L., Rice, M. & Sundararajan, M. (2004). The Role of Incubators in the Entrepreneurial Process. *Journal of Technology Transfer*, Volume 29 Issue 1, pp. 83-91.
39. Phillips, R. G. (2002). Technology Business Incubators: How Effective as Technology Transfer Mechanisms? *Technology in society*, Volume 24, Issue 3, pp. 299-316.
40. Pukite, I., & Geipele, I. (2015). Business Incubators as a Financial Instrument for New Business Development. In *Economic Science for Rural Development Conference Proceedings*, No 39, pp. 124-133.
41. Ratinho, T., Harms, R. & Groen, A., (2011). Are Business Incubators helping? The Role of BUSINESS INCUBATORS in facilitating firm development. *An Examination of Business Incubators' Impact on Tenant Forms*. Twente: CPI Woermann Print Service, pp. 134-174.
42. Rutitis, D., Smoca, A., Uvarova, I., Brizga, J., Atstaja, D., & Mavlutova, I. (2022). Sustainable Value Chain of Industrial Biocomposite Consumption: Influence of COVID-19 and Consumer Behavior. *Energies*, Volume 15, Issue 2, p.466.
43. Spender, J., Ripa, P., Corvello, V. & Grimaldi, M. (2017). Startups and Open Innovation: A Review of the Literature. *European Journal of Innovation Management*, Volume 20, Issue 1, pp. 4-30.
44. Steinbergs, K., & Cane, R. (2021). Entrepreneurship in Cultural and Creative Industries as a Factor Promoting Regional Development. In *Economic Science for Rural Development Conference Proceedings*, No 55, pp. 196-206.
45. *Sustainable Development Goals*, UNDP (2022). Retrieved: <https://www.undp.org/sustainable-development-goals>. Access: 20.03.2022.
46. Tallinn Technical University (2022). Retrieved: <https://taltech.ee/en/>. Access: 08.03.2022.
47. Theodorakopoulos, N., Kakabadse, N. K., & McGowan, C. (2014). What Matters in Business Incubation? A Literature Review and a Suggestion for Situated Theorising. *Journal of small business and enterprise development*, Volume 21, Issue 4, pp. 602-622.
48. Uvarova, I., Platonova, I., Rascevska, Z., Volkova, T., & Atstaja, D. (2021). The Value Co-creation in Circular Business Models: Quadruplex Helix Perspective. In *Proceedings of the 6th International Conference on New Business Models: New Business Models in a Decade of Action: Sustainable, Evidence-Based, Impactful*. Halmstad, Sweden, pp. 9-11.
49. Vanhaverbeke, W., Frattini, F., Roijackers, N., & Usman, M. (Eds.) (2018). *Researching Open Innovation in SMEs*. World Scientific. p.21.
50. West, J., Salter, A., Vanhaverbeke, W., & Chesbrough, H. (2014). Open Innovation: The Next Decade. *Research policy*, Volume 43, Issue 5, pp. 805-811.