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The incubation center model at universities: promoting entrepreneurial innovation and technology transfer

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ABSTRACT. The objective of this study is to analyze the necessity of incubation center models in universities in the current economic and social context. From this analysis, we aim to propose a framework for establishing and operating incubation centers at universities to promote entrepreneurial innovation and technology transfer. This research utilizes a systemic approach, analyzing the design process and the operation procedures of incubation centers at universities. The analytical and evaluative methods are based on various sources, including literature reviews, research reports, and information from existing university-based incubation centers. Furthermore, discussions with experts in entrepreneurship and technology transfer were conducted. Researchers provided specific questions to these experts and practitioners to gather detailed insights into the importance of establishing incubation center models in Vietnamese universities and the practical experiences currently implemented. The uniqueness of this study lies in its construction of a comprehensive framework and detailed analysis of the establishment and development processes of incubation centers at universities, specifically focusing on promoting entrepreneurial innovation and technology transfer. It provides specific information and demonstrates the value of this approach in advancing both the economy and society, fostering the linkage between research, scientific and technological applications, commercialization of scientific and technological products, and creating a conducive environment for the transfer and innovation of technology to enhance production efficiency and competitiveness for businesses.

Keywords: incubation center; entrepreneurship; innovation; technology transfer; digital workforce.

O modelo de centro de incubação nas universidades: promovendo a inovação empresarial e a transferência de tecnologia

RESUMO. O objetivo deste estudo é analisar a necessidade de modelos de centros de incubação em universidades no atual contexto econômico e social. A partir desta análise, pretendemos propor uma estrutura para estabelecer e operar centros de incubação em universidades para promover a inovação empresarial e a transferência de tecnologia. O enquadramento teórico do desenvolvimento de centros de incubação nas universidades enfatiza o seu papel crucial como elo vital entre a academia e as empresas. A fusão das instituições de ensino superior com as empresas cria um ambiente propício para os estudantes nutrirem as suas ideias e transformá-las em produtos tangíveis ou projetos práticos. Além disso, o referencial teórico deste artigo também explorará fatores críticos como apoio financeiro, educação e networking na promoção do desenvolvimento de projetos inovadores de startups. Os resultados da investigação delinearam um procedimento para estabelecer e operar centros de incubação em universidades. O desenvolvimento de tais centros nas universidades traz múltiplos benefícios. Em primeiro lugar, cria um ambiente inovador para os alunos, permitindo-lhes materializar as suas ideias e desenvolver competências empreendedoras. Em segundo lugar, os centros de incubação funcionam como centros que promovem a colaboração entre universidades, instituições de investigação e empresas. Em terceiro lugar, estes centros facilitam os processos de consultoria, avaliação, colaboração, aplicação, transferência de tecnologia e inovação para acelerar a aplicação dos resultados da investigação e das novas tecnologias na produção prática e nas operações comerciais, resultando numa elevada eficiência económica e social. Por último, criam oportunidades de emprego, promovem a diversificação económica e constroem ligações de rede vitais dentro da comunidade, ligando os estudantes a universidades, empresas e organizações patrocinadoras. A importância desta pesquisa reside no fornecimento de informações valiosas às universidades e autoridades governamentais sobre a importância do desenvolvimento de centros de incubação. Com base nos procedimentos propostos, as universidades estarão mais bem equipadas para compreender o ambiente, as necessidades e o potencial empreendedor da comunidade universitária. Este

artigo também ajuda os decisores políticos a definir políticas mais eficazes de apoio ao empreendedorismo e à transferência de tecnologia. A nível social, a promoção do desenvolvimento de centros de incubação promove uma sociedade criativa e inovadora, impulsionando o desenvolvimento sustentável.

Palavras-chave: Centro de incubação de empresas; atitude empreendedora; inovação; transferência tecnológica; mão de obra digital qualificada

El modelo de centro de incubación en las universidades: impulsando la innovación empresarial y la transferencia de tecnología

RESUMEN. El objetivo de este estudio es analizar la necesidad de modelos de centros de incubación en las universidades en el contexto económico y social actual. A partir de este análisis, pretendemos proponer un marco para establecer y operar centros de incubación en universidades para promover la innovación empresarial y la transferencia de tecnología. Esta investigación utiliza un enfoque sistémico, analizando el proceso de diseño y los procedimientos de operación de los centros de incubación en las universidades. Los métodos analíticos y evaluativos se basan en diversas fuentes, incluidas revisiones de literatura, informes de investigación e información de centros de incubación universitarios existentes. Además, se llevaron a cabo debates con expertos en emprendimiento y transferencia de tecnología. Los investigadores formularon preguntas específicas a estos expertos y profesionales para recopilar información detallada sobre la importancia de establecer modelos de centros de incubación en universidades vietnamitas y las experiencias prácticas implementadas actualmente. Los resultados de la investigación han esbozado un procedimiento para establecer y operar centros de incubación en las universidades. El desarrollo de estos centros en las universidades aporta múltiples beneficios. En primer lugar, crea un entorno innovador para los estudiantes, permitiéndoles materializar sus ideas y desarrollar habilidades empresariales. En segundo lugar, los centros de incubación sirven como centros que fomentan la colaboración entre universidades, instituciones de investigación y empresas. En tercer lugar, estos centros facilitan procesos de consultoría, evaluación, colaboración, aplicación, transferencia de tecnología e innovación para acelerar la aplicación de los resultados de la investigación y las nuevas tecnologías en la producción práctica y las operaciones comerciales, lo que resulta en una alta eficiencia económica y social. Por último, crean oportunidades de empleo, promueven la diversificación económica y construyen conexiones de redes vitales dentro de la comunidad, uniendo a los estudiantes con universidades, empresas y organizaciones patrocinadoras.

Palavras-chave: Centro de incubação de empresas; atitude empreendedora; inovação; transferência tecnológica; mão de obra digital qualificada

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Introduction

The establishment of incubation centers at universities is currently driving innovation, entrepreneurship, and technology transfer in the digital economy. This demonstrates a clear awareness of the crucial role of higher education in fostering entrepreneurial creativity and expediting the application of research findings and new technologies into practical business operations, resulting in high economic and social effectiveness and sustainability. This is an essential part of strengthening the relationship between universities and businesses to maximize potential and promote creativity within the university community (Wonglimpiyarat, 2016; Kirby, 2006).

Incubation centers at universities are where students and faculty members can promote new ideas, projects, and products to turn concepts into reality. They create a creative environment where individuals can work together, share knowledge, and learn from each other (Allen & O'Shea, 2014). These centers serve as a bridge by providing workspace, initial financial support, and entrepreneurship-related training programs. Furthermore, they play a crucial role in transferring technology from academic research to commercial applications. Potential research projects are often nurtured and developed at these centers before entering the market (Carayannis et al., 2016).

This trend reflects a shift in the mindset of universities. It provides opportunities for students and entrepreneurs to interact with academics, businesses, and investors. Students can learn from experienced individuals and establish crucial relationships. Universities are transitioning from traditional academic knowledge dissemination to creating an environment that fosters creativity and business development (Alexander & Evgeniy, 2012). This helps drive economic and social development at both local and global levels.

The development of the incubation center model at universities not only supports the provision of initial investment for promising startup projects but also reduces financial barriers for those with ideas but lacking the capital to start. This contributes not only to economic development but also to the establishment of a creative and innovative society, creating employment opportunities, promoting economic diversification, and building crucial networking connections within the community (Ramar et al., 2020).

This study aims to propose a model for establishing incubation centers at universities to promote entrepreneurship and technology transfer. This model prioritizes fostering entrepreneurship and technology transfer. In Vietnam, this model is developed through the collaboration between universities and enterprises. Universities with incubation centers are often regarded as the vanguards of innovation and creativity. The establishment of incubation centers at universities not only benefits the local community but also contributes to enhancing the status and sustainable development of universities in the fields of education and research. This helps to bolster the reputation and prestige of the university within the community as well as in the education and research sectors.

Methodology

This section presents two interrelated points emphasizing the necessity of a clear conceptual framework and a rigorous methodological approach in researching the incubation center model at universities to facilitate broader scholarly discourse within the existing research. The establishment of incubation centers at universities to promote entrepreneurial creativity and technology transfer demands a clear conceptual framework and a rigorous methodological approach to develop a practical proposed model that aligns with real-world practices. First, to research the incubation center model at universities, it is essential to define a conceptual framework concerning critical factors that need investigation, including organizational structure, objectives, processes, and the impact of incubation centers on the university community and businesses. After establishing the conceptual framework, a specific methodological approach must be constructed to execute the proposed model solution for setting up incubation centers at universities. To obtain this data, the authors met with experts and leaders from universities in the North Central and Northern Mountainous regions to solicit their opinions on the necessary steps to establish an incubation center at universities. This involves selecting data collection methods (such as surveys, interviews, document analysis), determining the participant sample (such as students, faculty, entrepreneurs), and planning the research implementation from data collection to analysis and evaluation.

Conceptual Framework for the Incubation Center Model at Universities

Business incubators are collaborative organizations involving centers, research institutes, universities, government authorities, and startup enterprises (or groups/individuals intending to establish businesses). The purpose of a business incubator is to create a nucleus and environment to 'nurture' startup enterprises for a specified period so that these entities can overcome initial challenges, assert their existence, and develop into independent businesses (Peters et al., 2004). Incubators play a role in providing necessary services and infrastructure to support entrepreneurship, from the ideation phase, product development, to the establishment and successful growth of businesses. Technology business incubators are where ideas, innovations, and research results in science and technology are nurtured into businesses (Boh et al., 2016).

Incubation centers serve as hubs, influencing and facilitating interaction and connections between universities, research organizations, and businesses. They are also spaces for organizing consulting, assessment, selection, linkage, collaborative application, technology transfer, and innovation activities, aimed at accelerating the application of research results and new technologies into practical production and business operations for enterprises. This leads to high economic and social efficiency and sustainability, benefiting not only specific regions in the northern midlands and mountainous areas but the entire country as well (Audretsch, 2014; Hang & Huan, 2020; Hang et al., 2021).

Before establishing an incubation center, universities need to conduct research and assess relevant factors to gather information and gain a clear understanding of the entrepreneurial environment, needs, and potential within the university community. These factors include the market, human resources, sources of funding and finance, entrepreneurship support systems (consulting), legal framework, and infrastructure. Additionally, seeking input from advisors, experts, and consultants who participate in supporting idea formation and the transformation of ideas into specific actions is crucial (Guerrero et al., 2014).

Furthermore, in order to establish an incubation center, universities should explore trends and potential collaborations between universities and businesses. This involves gathering information about the supply and demand of science and technology products from universities and businesses for technology innovation, equipment, and technology transfer activities. This information serves as the foundation for the incubation center to conduct support and consultation activities, aiming to introduce, market, and transfer technology to partners in need (Kruger, & Steyn, 2020). Consequently, it fosters a connection between research, the application of scientific and technological results, commercialization of scientific and technological products, and creates a favorable environment for the technology transfer and innovation process to serve production and enhance competitiveness for businesses.

The Practical Methodology for Establishing an Incubation Center Model at Universities

Currently, the model of incubation centers at universities is gaining significant attention and becoming an important global practice. This stems from a profound understanding of the crucial connection between higher education and businesses in fostering innovation, entrepreneurship, and technology transfer. In the era of digital transformation and the increasing number of digital startups, universities worldwide are actively becoming entrepreneurial universities. Beyond their traditional roles in education and scientific research, universities are now focusing on their third mission: innovation renewal (Jansen et al., 2015). This involves linking educational and research activities to the commercialization of intellectual assets resulting from research outcomes, fostering the growth of startups and spin-offs.

Through the incubation center model, universities are developing their capabilities in terms of finances, management, human resources, infrastructure, and enhancing their reputation in applied education and research. Establishing an incubator is the initial step universities take to transform and develop in this direction (Etzkowitz, 2002). By forming incubators and implementing various entrepreneurial and innovation activities, universities can excel not only in their traditional roles but also in strengthening their ties to the market (Smilor, & Matthews, 2004).

Incubation centers provide not only the benefit of connecting universities with the business community but also help universities produce graduates whose skills align with practical market demands. This enhances the quality of human resources, meeting the labor market's needs. Simultaneously, it assists businesses in adding value, building credibility, and gaining a competitive edge in the market. As products of higher education institutions, students also benefit from being trained and exposed to entrepreneurial and innovative thinking through various activities during their academic journey (Valdivia, 2013). This is particularly essential in today's context, where concepts related to jobs, workplaces, science and technology trends, and the global labor market are rapidly evolving and challenging to predict.

Through incubation activities, universities actively contribute to implementing the policies of the Party and the State related to fostering entrepreneurship and innovation. They play a role in building and developing the national entrepreneurial and innovative ecosystem, contributing to the development of the community and society. This helps improve macroeconomic indicators related to global competitiveness and global innovation capacity, serving the current and future development of Vietnam in the era of Industry 4.0 (Olcay & Bulu, 2016).

In conclusion, the development of incubation centers at universities worldwide signifies their commitment to fostering innovation, entrepreneurship, and technology transfer. This contribution goes beyond academia, extending to society, and plays a crucial role in shaping a prosperous future for all.

Incubation models in universities in some typical countries

There are currently a total of 7,000 incubation centers worldwide. Many countries have focused on establishing science and technology business incubation centers, especially those located at universities, from a very early stage. The United States is considered the country with the strongest incubation ecosystem (Rice Alliance of Technology and Entrepreneurship at Rice University) and has many incubation centers among the top 25 high-level incubators in the world established at universities (with four incubation centers).

The United States has more than 55 years of experience in incubation activities with 1,200 incubation centers. Another example is the United Kingdom, the birthplace of the first industrial revolution, which has also established numerous technology incubators within universities and has the second-strongest incubator globally among the top 25 high-level incubators established at universities, known as the University’s Innovation Company. This company carries out two important missions through two affiliated units: the Innovation Centre (UMIC)

providing infrastructure (offices, labs) to support technology-based startups, and the University of Manchester Intellectual Property (UMIP) responsible for protecting and commercializing the university's research results through the sale and transfer of intellectual property assets and equity from spin-out companies.

The third-largest incubator in the top 25 high-level incubators in the world is located at the South China University of Technology in China. Additionally, some other countries such as Taiwan, Sweden, and Chile also have two incubators in this top group.

In Southeast Asian countries like China, South Korea, Taiwan, and Singapore, there has been significant emphasis on developing technology incubation models within universities. Thailand currently has over 90 incubators, while Taiwan has 130 technology incubation centers. The first technology business incubator in Taiwan was established in 1997, and since then, more than 130 incubation centers have been developed in Taiwan.

The incubation center model at some prominent universities in Vietnam

The incubation center model at universities in Vietnam is currently experiencing significant development to foster innovation, entrepreneurship, and technology transfer within the country's economy.

Starting from the current reality, the commercialization of research results from research institutes and universities in our country has shown positive trends. Many research outcomes have been transferred to businesses, generating revenues in the tens or even hundreds of billions of Vietnamese dong. For example, the Ho Chi Minh City University of Technology, from 2009 to 2019, achieved nearly 1,300 billion Vietnamese dong in revenue from research results commercialization activities. According to the assessment of the Ministry of Science and Technology, after 5 years of implementing the Science and Technology Market Development Program (2016-2020), in 2020 (Program 2075), 63 tasks out of 500 proposed were approved, with a total budget of 340 billion Vietnamese dong. Of this amount, 194 billion Vietnamese dong (accounting for approximately 55%) came from the state budget, while the remaining approximately 45% of the funding was contributed by the participating businesses for task implementation.

The Ministry of Science and Technology has defined its strategy for the development of the Science and Technology Market for the 2021-2030 period, focusing on promoting the development of both supply and demand sides, enhancing connectivity, and moving towards harmonizing the Science and Technology Market with commodity, labor, and financial markets. Therefore, there is a need to strongly develop intermediary organizations and incubation centers to clearly demonstrate their roles in technology transfer and research results consultancy activities. The establishment and improvement of centers and intermediary organizations for Science and Technology Market in universities are essential solutions to enhance cooperation between educational institutions, management authorities, and businesses, contributing to increasing the commercial value of scientific and technological products.

From the 1990s to the present, Vietnam's technological capabilities have seen remarkable development. The advancement of science and technology has become a major driving force for the country's socio-economic development in the current period. The science and technology development strategy for the period 2011-2020 set the goal of establishing 30 science and technology business incubators by 2015 and 60 incubators by 2020.

Government Decision No. 209 regarding the planning of the network of higher education institutions also emphasizes the need for planning to improve the efficiency of investment and the quality of education, promote innovation and creativity, and connect with businesses. This includes the establishment of science parks and industrial complexes that bring together universities, research institutes, and businesses in the same area, thus fostering collaboration between universities and enterprises.

The state's policy on higher education development is specified in Article 12 of the Higher Education Law, which states: "Promote cooperation between higher education institutions and enterprises...encourage organizations, institutions, and businesses to receive, provide conditions for learners and lecturers to practice, intern, conduct scientific research, transfer technology, and contribute to improving the quality of education" (National Assembly, 2012). However, the specific implementation of this policy is still lacking, and it has not created the necessary policy environment to build strong and mutually beneficial relationships between universities and enterprises.

As of now, Vietnam has established more than 15 incubation centers (in 2009, there were 11 incubation centers with 47 incubated companies). This is a modest number when compared to the total of 7,000 incubation centers worldwide. These incubation centers are currently categorized into three groups: incubation centers in high-tech zones, incubation centers within universities, and incubation centers within

businesses. In the northern region, there are five incubation centers, including those under the Management Consultancy and Research Center (CRC) at Hanoi University of Science and Technology, HBI Incubator, and the High-Tech Business Incubator at Hoa Lac High-Tech Park, among others. In the southern region, there are six incubation centers, including the High-Tech Business Incubator at Saigon HiTech Park, the technology business incubation center at Ho Chi Minh City University of Technology, and others.

One of the successful university-based enterprise models in Vietnam is BK Holdings. This was the first enterprise model permitted to be established at a public university in Vietnam nearly 20 years ago, under the administration of Hanoi University of Science and Technology. BK Holdings Incubator is one of the three main branches within the BK Holdings system, responsible for issues related to incubating science and technology enterprises and startups. The BK Holdings incubator targets two main groups: research staff and students.

Given its capability to carry out hundreds of research projects and collaborations with external businesses each year, the incubator's goal with research staff is to commercialize research outcomes. To harness the enthusiasm and creativity of students, the incubator aims to enhance entrepreneurial awareness, culture, and basic knowledge. Since 2013, Hanoi University of Science and Technology has organized numerous innovation and startup competitions for students with a rich variety of ideas. These competitions typically span several months, include training, mentorship, exposure to technology businesses, and access to investors. Some ideas and products that have received positive evaluations include a 3D scanning system for small-sized objects, a bone model printing project for medical applications, a solar-powered wastewater color removal system for industrial purposes, and a facial recognition software for supermarket checkout lines.

Each year, the Young Innovation Competition at Hanoi University of Science and Technology attracts nearly 100 participating teams, with 10 teams advancing to the finals. These teams receive initial funding of around 20 million VND (approximately 900 USD) to develop their ideas into prototypes or upgrade existing prototypes. After the competition, only a small percentage, approximately 5 teams, continue to pursue their ideas. These teams receive support in connecting with businesses, advisors, and relevant investors. However, only 2 teams manage to secure investors or business partnerships. The process of establishing a company from that point onward involves facing many challenges.

To date, BK Holdings' incubator has successfully incubated 9 enterprises (excluding external enterprises incubated by the university). While this number is relatively high compared to other universities, it still falls short of the significant potential of Hanoi University of Science and Technology.

In the world, there are many successful business incubators such as Business Innovation Centre (BIC), Business Incubator (UBI), Independent Private Incubator (IPI), and Private Business Incubator (CPI). The existence of various incubators and the evolution of their business models over time have been driven by the development of companies' requirements and needs, which has led to diversification of their product and service offerings. Techstars is also considered a global network of startup incubation centers, operating in many cities worldwide. Techstars programs provide startups with capital, advisory support, and networking opportunities with investors and businesses. MassChallenge (United States): MassChallenge is a startup incubation center in Boston, Massachusetts, specializing in supporting startups in all fields, with no limitations on industries. They provide workspace, resources, and networking opportunities to help businesses grow. RocketSpace is a startup incubation center in London, United Kingdom, focusing on technology and innovation sectors. They provide modern workspace and support resources for startups to develop and expand. Therefore, the successful incubation centers have clearly demonstrated the strength and influence of these facilities in promoting innovation and entrepreneurial development.

Proposal for the process of establishing a technology incubator widely applicable at universities

A technology incubator is a component of the national innovation and entrepreneurship ecosystem with the role of promoting and nurturing entrepreneurial ideas, innovation, among students and faculty. It is a comprehensive support model that universities emphasize to cater to student startup groups and newly established entrepreneurial ventures through activities providing shared services, training, financial support, consulting, and investment attraction support (Dill, 1995). To establish a technology incubator, universities need to define the primary goals of the incubator. For instance, they can choose one or several objectives, such as fostering innovation, supporting startups, forming partnerships with businesses, technology transfer, and promoting applied research (Wright et al., 2004). Subsequently, they should proceed with the planning and strategy formulation for the establishment and management of the technology incubator, along with identifying the necessary financial resources and required assets for plan implementation. Constructing

physical infrastructure, including workspace and laboratories (if necessary) and other essential facilities, is also essential. The unique socio-economic factors and cultural context can contribute to diversity in establishing technology incubators at universities across different countries or regions. Notably, the level of available financial resources significantly impacts the investment and development capacity of these incubators. In wealthier countries, incubators may have larger financial resources, supporting numerous projects and research endeavors. Conversely, governmental and non-governmental support may vary. Policies aimed at encouraging entrepreneurship and research can create favorable or challenging conditions for incubators. The specific steps would cover what is shown in Figure 1.

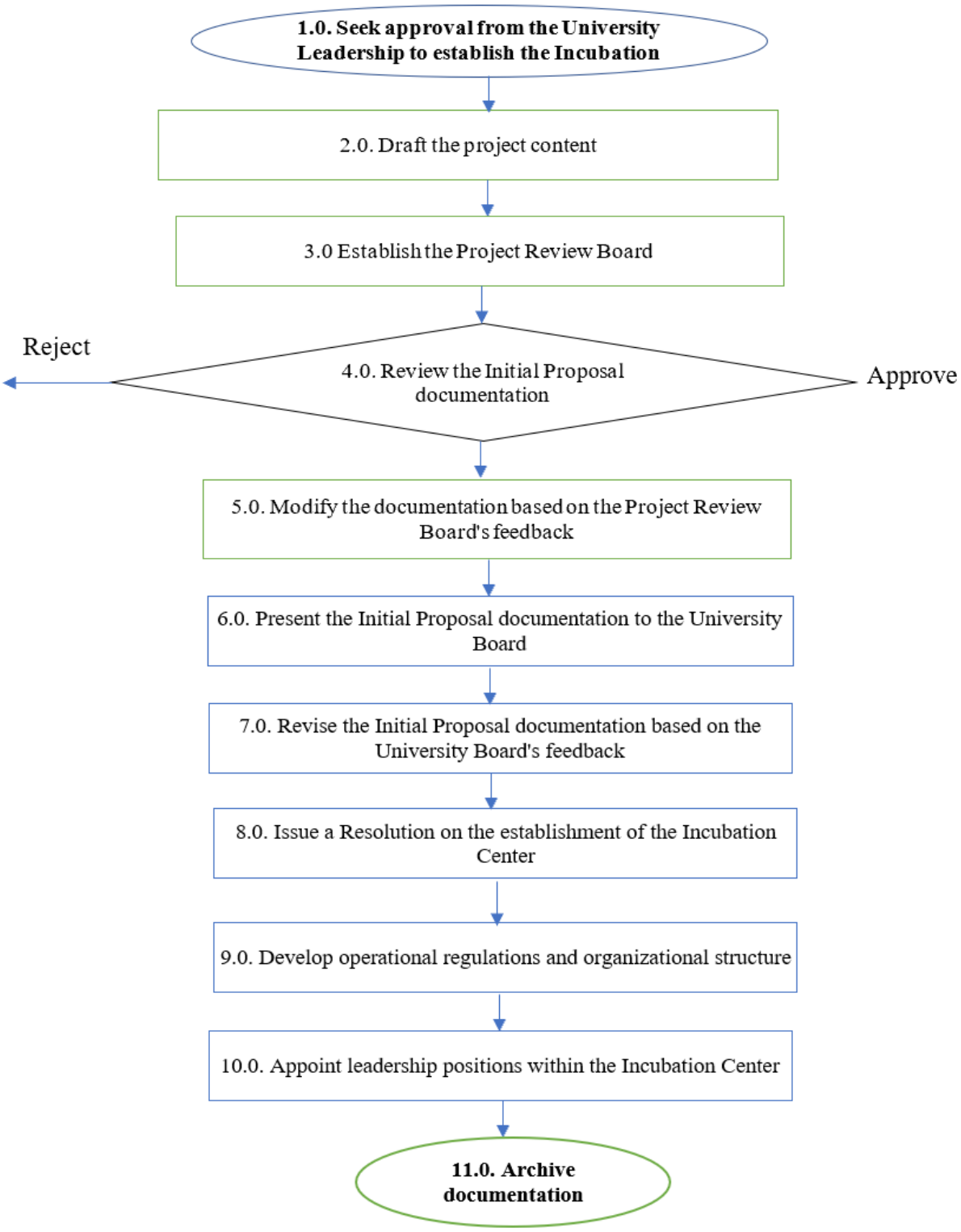

Figure 1. The process of establishing an incubation center at a university

Discussion the incubation center model at universities

The activities related to technology incubation and entrepreneurship in the field of science and technology have garnered significant attention from universities, demonstrating notable signs of success (Baglieri et al., 2018). Some incubation centers have solidified their position and role in providing technical support and guidance for technology incubation initiatives, ultimately leading to the emergence of robust startup ventures. These incubation centers, situated within the university environment, benefit from an abundance of innovative ideas, research-oriented infrastructure, and readily available fundamental technological products (Valdivia, 2013). Consequently, startups find it easier to leverage these resources for access and application.

To ensure that students are adequately equipped to meet the requirements of organizations and enterprises, especially in addressing the issue of imbalanced supply and demand for high-quality human resources, the government has encouraged universities to collaborate with businesses in education, scientific research, and technology transfer (M'Chirgui et al., 2018).

Incubation centers play a pivotal role in establishing a comprehensive support ecosystem for technology incubation and innovative entrepreneurship. This entrepreneurship ecosystem comprises several components: the market, human resources, capital and finance, startup support systems (consulting), legal framework, and infrastructure (Saad, & Zawdie, 2005). It also includes education and training, universities, and national culture. Advisors, experts, and consultants actively participate in various stages, starting from ideation to transforming ideas into concrete actions, ultimately leading to successful execution.

From the development of innovative ideas to commercializing those ideas and attracting investment, these centers serve as the core link connecting universities, educational institutions, and businesses. They contribute significantly to the socio-economic development in the context of globalization and international integration in the present era.

Although business incubators bring many benefits to both universities and businesses, establishing and operating an incubation center is not an easy task, and sometimes universities face numerous challenges (Grimaldi, & Grandi, 2005). One of the biggest challenges that universities have to deal with is the financial issue. To sustain the operation of the center, there needs to be a stable and sufficient source of funding, from attracting investment to maintaining sponsorship contracts. Additionally, resource management is also a significant concern for universities. They not only have to manage finances but also human resources, office space, and other resources to ensure the effectiveness and sustainability of the center (Rho et al., 2017).

Another challenge lies in legal and regulatory matters. Compliance with legal regulations as well as safety and environmental protection regulations can sometimes pose significant risks and costs for the center. Moreover, careful consideration is needed regarding data protection and intellectual property rights, especially when working with startups or projects related to technology and innovation. Additionally, risk management is also a concerning issue when establishing an incubation center. Starting a new business always involves risks, and the incubation center must have the ability to assess and manage risks effectively to protect both the business and investors (Klaasa, & Thawesaengskulthai, 2018).

The establishment of a startup incubation center is a structured process designed to foster innovation and entrepreneurship within academic institutions. As outlined in Table 1. Detailed description of the incubation center establishment process, the journey begins with Step 1.0, where the university principal requests the Party Committee's policy approval, led by individuals or groups proposing the idea, resulting in a formal resolution. In Step 2.0, the Administrative Department guides the drafting of the project profile based on regulations, ensuring a solid foundation. Step 3.0 involves the university principal establishing a Project Review Board, coordinated by the administrative office, culminating in a council decision. The appraisal process (Step 4.0) evaluates the initial proposal, producing minutes on approval or revisions, followed by modifications in Step 5.0 to refine the documentation. Step 6.0 presents the proposal to the University Board, led by the principal and administrative office, yielding a council resolution. Further revisions based on feedback occur in Step 7.0, ensuring alignment with institutional goals. Step 8.0 formalizes the center's establishment with a resolution from the university president, supported by the administrative office. Subsequent steps, including developing operational regulations (Step 9.0), appointing leadership (Step 10.0), and archiving documentation (Step 11.0), solidify the center's structure and operations. This systematic approach, coordinated by key stakeholders, ensures a robust framework for nurturing startups.

Table 1. Detailed description of the incubation center establishment process.

Step	Work content	Responsibility	Implementer/coordinator	Result
1.0	Request the Party Committee's policy to establish an Incubation Center	University principal	Individual/group proposes the idea of establishing a startup incubation center	Resolution of the Party Committee
2.0	Draft the content of the Project to establish a startup incubation center	Individual/group proposes the idea of establishing a startup incubation center	The Administrative Department will guide the drafting according to regulations	Project profile
3.0	Establish the Project Review Board	University principal	Administrative office held	Council Decision
4.0	Review the Initial Proposal documentation	Appraisal Council for the Project to establish a startup incubation center	Individual/group proposes the idea of establishing a startup incubation center Administrative office held	Minutes of appraisal of dossier on approval/disapproval/editing of dossier for establishment of incubation center
5.0	Modify the documentation based on the Project Review Board's feedback	Individual/group proposes the idea of establishing a startup incubation center	Administrative office held	Document of the Project to establish an incubation center has been edited
6.0	Present the Initial Proposal documentation to the University Board	University principal	Administrative office held; Secretary of the University Board	Resolution of the University Council on approving/not approving/editing the dossier to establish an incubation center
7.0	Revise the Initial Proposal documentation based on the University Board's feedback	Individual/group proposes the idea of establishing a startup incubation center	Administrative office held	Document of the Project to establish an incubation center has been edited
8.0	Issue a Resolution on the establishment of the Incubation Center	President of the University Council	Administrative office held; University council secretary	Resolution of the University Council on the establishment of an incubation center
9.0	Develop operational regulations and organizational structure	Individual/group proposes to establish an incubation center		
10.0	Appoint leadership positions within the Incubation Center	University principal	Administrative office held;	
11.0	Archive documentation			

Conclusion

Technology business incubators serve as essential tools for fostering creativity, innovation, technology transfer, and successfully commercializing technological ideas. They achieve this through closer integration of university-research institution-enterprise relationships (Heinzl et al., 2013). These incubators provide seed funding for startups and assist businesses in seeking and increasing seed capital. Additionally, this model positively impacts the relationship between businesses and the government, acting as a testing ground for the government's policies' appropriateness and effectiveness (Saad, & Zawdie, 2005).

From a global perspective, universities play a crucial role in nurturing new technology projects. Establishing businesses based on research from universities has become a vital part of many countries' innovation and creativity policies. Therefore, universities need to enhance their ability to connect academic communities with students by organizing training sessions and entrepreneurship courses.

Universities should show greater interest in the activities of incubation centers through infrastructure development and creating an environment conducive to entrepreneurial ideas. Increasing investments in facilities for incubation centers, such as shared workspaces and seminar rooms, can help students explore and develop their entrepreneurial ideas.

It's crucial to develop multifaceted relationships with businesses, venture capital funds, and angel investors to establish financial support funds for student startup projects. Universities should organize idea-sharing events to connect students with potential partners and investors.

In summary, technology business incubators play a vital role in fostering innovation and entrepreneurship. To strengthen this role, universities must invest in infrastructure, enhance connections with the business community, and facilitate financial support for student startups. Building a robust ecosystem for innovation and entrepreneurship will benefit not only students but also the broader society and economy.

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