

Incubators in Multinational Corporations

Development of a corporate incubator operator model

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Abstract—This paper analyzes the components of a corporate incubator operator model in multinational companies. Thereby, three relevant phases were identified: pre-incubation, incubation, and exit. Each phase contains different criteria that represent critical success factors for a corporate incubator, which are based on theoretical findings and lessons learned from practice. During the pre-incubation phase companies should define their need for a corporate incubator, the origin of ideas and the selection criteria for incubator tenants. The actual phase of incubation refers to the incubator program, which should be flexible with respect to each tenant. Furthermore, resource allocation plays an important role during the incubator program. Exit options after a successful incubation differ according to internal ideas and external start-ups, as well as the objective of the incubator. The research is based on a comprehensive screening of existing incubator literature and a qualitative content analysis of statements from eight experts of international corporate incubators.

Keywords—corporate incubator; intrapreneurship; business model innovation; operator model

I. INTRODUCTION

Traditionally, research and development (R&D) units have been the source of innovation for many corporations and at the same time basis for their competitive advantage [1]. However, nowadays it becomes increasingly important for firms to quickly adapt to emerging trends within their area of business in order to avoid losing market shares and to remain competitive in the long-run. Furthermore, being considered an innovative company has a positive impact on the image of a corporation [2]. By facing these new challenges, corporate incubators have recently emerged as a modern instrument of R&D management [3]. The trend of incubation has its origin in the United States, where the first incubator was established in 1959 [4]. Several authors describe corporate incubators as

“specialized corporate units that hatch new businesses by providing physical resources and support” [5]; [6]; [7]. As this phenomenon is still young and many corporations are facing the challenge of designing and implementing corporate incubators, this study has the aim to suggest a corporate incubator operator model by following a holistic approach. Even though prior research addresses several attempts of incubator models, it has been detected that these approaches are rarely applicable and individual solutions need to be identified [4]. In the context of this study, the following research question is analyzed:

What dimensions need to be included into a corporate incubator operator model for a successful implementation?

After a comprehensive screening of existing theoretical approaches of incubator models, this study relies on a number of expert interviews for defining required categories and criteria. A comparison of practical corporate incubator models results in the determination of critical success factors and the proposal of a generally applicable corporate incubator operator model.

II. THEORETICAL FRAMEWORK OF CORPORATE INCUBATORS

In order to get an understanding of the research topic of this paper, the following passages explain the concept of incubation and the classification of corporate incubators, which will be further analyzed in the empirical part of this study.

A. Definition of incubation

The term incubator has its origin in the Latin word “incubare”, which refers to the hatching of birds’ eggs according to natural sciences. Initially, the name incubator was used in the context of human medicine and describes a place for

newborns that ensures their growth and development in a protected environment [4]. Economic sciences suggest several definitions of incubators, which differ with respect to their orientation and focus of the program and describe them as:

“an entity that “hatches” new ideas by providing physical resources and support to nurture the growth of new business ventures, which can either be an independent start-up, or an internal corporate venture” [9]; [5].

“property based initiatives [11] providing their tenants with a mix of services encompassing infrastructure, business support services and networking” [12]; [5]; [13]; [14].

„useful facilities where fledgling enterprises can survive and grow in a supportive environment” [15].

Due to the large number of incubator definitions that in some part contain a different understanding of the concept, this paper applies the following working definition:

An incubator represents an institution where founders or start-ups receive the required environment for making their idea or product market-ready.

B. Historical context of the incubator concept

The concept of incubation dates back to 1959 when the first incubator was established at Batavia, New York [16]. Back then, a building of 79,000 square meters was located on the premises of a shutdown corporation and office space was rented to several businesses, who could not afford to lease the entire facility [17]. In addition, the incubator also provided office services, the procurement of funding possibilities and business advice to its tenants for a small fee [4]. Besides the development of return-oriented forms of incubators, the concept was also initiated close to leading universities and research institutes in the 1960s and 1970s with the aim to commercialize new technologies and innovation [18]. During the 1980s and the 1990s, the diffusion of incubator programs increased significantly and it became a trend to develop business incubators around certain industrial and technological clusters [19]. By the end of 1990, a total of 600 incubators were established, which accelerated to 4,000 incubators in 2011 [20].

C. Types of incubators

Over time, several different archetypes of incubators have evolved (e.g. [21]). These types include for-profit and non-profit incubators [22]. Furthermore, five basic archetypes depend on various degrees of competitive focus: independent commercial incubators, regional business incubators, university incubators, company-internal incubators and virtual incubators [23]. It has been suggested that common characteristics of incubators refer to sponsorship, financing and objective of the program [24]. In order to sum up the vast amount of existing incubator definitions and classifications, the following table provides an overview about four main archetypes (following

[25]; [18]; [24]). As depicted in table 1, suggested incubator types include public, research-oriented, return-oriented and hybrid incubators. Non-profit incubators are sponsored either by federal institutions or universities as well as research facilities. The objectives of these public and research-oriented incubators basically target economic development of a region and funding is provided by the government and service revenues. In contrast, for-profit incubators are sponsored by investment groups or corporations in order to maximize the return of capital and other profit-related objectives. Hybrid incubator archetypes mainly represent joint ventures or a combination of several interest groups. In this case, objectives and funding of the incubator depend on the parties involved (e.g. [25]; [18]; [24]).

TABLE I. OVERVIEW ABOUT DIFFERENT TYPES OF INCUBATORS

	Public incubator	Research-oriented incubator	Return-oriented incubator	Hybrid and other incubators
Sponsorship	State, federal states, municipalities, charitable institutions	Universities, higher education institutions, research institutions	Investment groups, private persons, corporates	Joint ventures (state/charitable institutions and/or private holders), art associations, chambers of commerce
Profit	Non-profit	Non-profit	For-profit	Depending on the combination of incubator holders
Objective	Economic development (diversification of regions), increase of government tax revenues, job creation	Generation of innovation, economic development, commercialization of research results, involvement of faculty staff and students, providing research opportunities	Maximization of return of capital, promotion of corporate spin-offs, faster development of future markets, winning the customers of tomorrow, image as an innovative company	Depending on the combination of incubator holders
Funding	Government subsidies, service revenues	Government subsidies, service revenues	Service revenues, company shares in start-ups, financing by corporates/private persons	Depending on the combination of incubator holders

D. Corporate Incubator

This paper has a focus on corporate incubators, which represent a return-oriented form of incubation. These incubators are “managed as professional service firms, acting in the larger interest of their parent corporation while leveraging their knowledge networks” [26]. Furthermore, several authors define corporate incubators as “specialized corporate units that hatch new businesses by providing physical resources and support” ([5]; [6]; [7]). The diffusion of corporate incubators can be described as a relatively recent phenomenon [19]. Corporations make use of this concept in order to enable the development of small teams that are able to operate within a more flexible and non-bureaucratic environment, which certainly increases the speed of their actions. In addition, tenants of corporate incubators are encouraged to apply new perspectives that are independent from usual ways of thinking and organizational patterns [20]. By establishing corporate incubators, corporations for instance target the dissemination of intellectual capital within their organization [19]. On the other hand, the benefit for new ventures involves the access to the corporation’s brand image, production facilities and resources, which are all beneficial factors for the successful establishment of a product on the market [20]. Besides the mentioned advantages of corporate incubators, long lead-times have been addressed, ranging from 5-7 years, until operating firms of corporate incubators receive tangible and intangible returns [26]. This required “long-term persistence” [27] proves to be a challenge for many corporations, which leads to changes or even the elimination of such programs [26].

III. DEVELOPMENT OF A CORPORATE INCUBATOR OPERATOR MODEL

Existing literature provides numerous approaches for corporate incubator best-practices (e.g. [28]; [29]; [30]; [15]; [31]; [32]). However, only limited attention is paid to the development of a holistic operator model of corporate incubators and existing approaches require further alignment with current empirical data. In order to provide a basis to conduct empirical research, several established incubator models have been integrated, each capturing a different perspective of the concept.

The first analyzed model focuses on the following dimensions: selection of incubator tenants, business support and mediation [12]. Selection of incubator tenants refers to decisions concerning which new ventures to accept for entry into the incubator and which of them to reject. Several authors support the high relevance of this dimension (e.g. [33]; [7]; [34]), since effective resource allocation relies on a wise selection. While existing studies propose a wide variety of selection criteria, two main approaches have been described: Incubator tenant selection by focusing on their idea or by concentrating on the individual or team [12]. Furthermore, two approaches concerning the flexibility of applying certain selection criteria are revealed: “picking-the-winners” or “survival-of-the-fittest” [35]. In general, incubator managers need to possess the required knowledge in relevant technological fields, know-how

with respect to necessary business development requirements, as well as the ability to judge personality in order to select the right incubator tenants [12]. The relevance of the second dimension business support is also encouraged by previous studies (e.g [36]; [37]; [38]). Examples include entrepreneurial training or services concerning general business matters ([13]; [39]). In this context, different types of counselling have been distinguished that might be reactive or proactive [40]. Mediation, the third suggested dimension, relates to the incubator’s role of connecting the incubator tenants among each other and with the external environment ([33]; [41]; [42]). The aim of network mediation incorporates leveraging entrepreneurial talent and resources [43]. These networks enable the provision of information, knowledge and expertise that are all critical for the survival of new ventures [44]. Another form of mediation incorporates institutional mediation, which has the aim to support incubator tenants in the context of institutional demands such as laws or values [45].

A four-phase model of the incubation process [26] has been transferred from the venture capital literature [46]. Thereby, the following dimensions are distinguished: Selection, Structuring, Involvement and Exit that are depicted in form of a circuit. The flow of knowledge is heterogeneous among the four dimensions. The selection phase relates to the kind of technology ventures the incubator intends to attract such as innovative start-ups with a business plan and high growth potential. In connection with this, the new venture needs to fit with the corporate technology strategy. After the selection of a technology venture follows the structuring phase, which specifies the type of payment of the incubator tenant for the received services, as for example medium equity stakes. According to existing findings [26], the involvement of the incubator manager with the incubated technology ventures represents one of the most decisive and at the same time longest phases in their model, since it defines the quality of value added to the start-ups. Finally, the exit dimension describes certain exit criteria and measures for successful performance. In this context, financial criteria play a minor role in contrast to number of graduates or occupancy rate [26].

Another proposed incubator model [46] addresses four main areas where incubators create value: 1. the diagnosis of business needs, 2. the selection and monitoring of the services provided to the new ventures, 3. the investment of capital, and 4. the access to the network of the incubator. The depicted process of incubation attempts to explain how different components and activities of an incubator enable the transformation of a new business proposal into a viable new firm. It has been highlighted that the model fails when considering that all new businesses are potentially viable and by neglecting to be explicit about the selection criteria of incubators tenants [47].

Furthermore, the last analyzed study [28] addresses the external perspective of incubation by describing incubators as a transformation mechanism in which industry, government and university are interrelated. Support systems for new ventures include secretarial and administrative services, business expertise and facilities. Furthermore, this incubator model incorporates the benefits for incubator tenants that refer to the

following dimensions: credibility development, shortening the learning curve, faster troubleshooting and access to the network of entrepreneurs [28].

A. Methodological approach

In order to analyze the stated research question in greater detail, the empirical analysis of this paper relies on a number of conducted expert interviews. Experts define an appropriate role of interview partners as a source of specialist knowledge regarding the circumstances to be investigated [47]. The data of this study include the experts' experience and lessons learned from corporate incubators and at the same time detected findings with respect to required elements for a corporate incubator operator model were captured.

In the period from December 2016 until February 2017, eight interviews were conducted with representative experts from different multinational corporations that established a corporate incubator. The duration of the interviews accounts for 42-77 minutes and the anonymity of each expert was guaranteed. Furthermore, the interviews were conducted in English and German language, as the considered corporate incubators are located in various corporations, sectors and regions such as Europe, United States or Asia.

The main questions of the expert interviews refer to the following:

1. How can incubator tenants get into the incubator program?
2. How is the incubation process designed?
3. What follows after the incubation?

The expert interviews are characterized by an explorative approach where open questions are addressed to the participants. After the interviews were conducted, each audio file was transcribed in order to capture the content for further analysis.

Qualitative content analysis represents the selected methodology for evaluating and interpreting the executed expert interviews, which is based on the suggested approach of Mayring [48]. In this context, three distinct forms of interpretation are considered: summary, explication and structuring. A summary has the aim to reduce the existing material of data in order to obtain the essential content. For explication, text passages in question are supplemented by additional material in order to explain the respective passage in the text. Structuring refers to fixed ordering criteria that enable a cross sectional analysis of the material [48].

IV. FINDINGS FROM CORPORATE INCUBATOR LESSONS LEARNED

Based on the theoretical framework from prior studies (e.g. [26]; [12]), three main categories of incubation are described and examined by empirical data: 1) pre-incubation, 2) incubation, and 3) exit. In order to reveal critical success factors for each phase, sub-categories and corresponding criteria are explained and associated with anchor examples and citations from the experts' statements. Basic principles of the suggested categories

and criteria rely on prior research of mentioned authors (e.g. [33]; [47]; [30]; [26]; [12]).

Besides the illustration of a holistic corporate incubator operator model, the aim of this analysis includes detecting suitable additional criteria that have not been mentioned by existing studies so far. Table 2 provides an overview about the analyzed categories and criteria of incubation.

TABLE II. Dimensions of a corporate incubator operator model.

Category	Sub-category	Criteria
Pre-Incubation	Diagnosis of needs	Focus of the incubator
		Type of innovation
	Origin of ideas	External start-ups
		Internal ideas
	Selection of tenants	Decision-making committee
		Selection criteria
Incubation	Incubator program	Duration of the program
		Content of the program
	Resource allocation	Coaching
		Network
		Business support
		Financing
Exit	Internal Ideas	Spin-off
		Integration into the corporation
		Sale of an idea
	External start-ups	Acquisition
		Purchase of shares
		Supplier contract

A. Pre-Incubation

The first category of a corporate incubator operator model refers to pre-incubation, which describes the phase before the actual incubator program starts. It is suggested to divide this category into three sub-categories: diagnosis of needs, origin of ideas, and selection of incubator tenants. According to the interviewed experts, the diagnosis of needs differs with respect to several corporate incubators: “Our goal is mainly cultural transformation” (Expert E); “Our main target is actually to source new products” (Expert G). In this context, the type of innovation as well as the focus of the incubator seem to play a decisive role. Furthermore, the focus of the incubator is supported as an important criterion by several experts: “We choose these start-ups with fit into the strategic idea of our company” (Expert A). Another expert from the automotive sector highlights that the focus of the corporate incubator should match the company’s business area: “It always has to do something with mobility” (Expert E).

The second sub-category of pre-incubation refers to the origin of ideas: “This is the grail of innovation management, where do great ideas come from [...] very rarely an individual comes up with a the next big thing, but in most cases great ideas result from the interplay of several people [...] At the end it is decisive that we have the most diverse ideas in-house from totally different people” (Expert D). The following two categories enable a distinct consideration of this sub-category: ideas from external start-ups and ideas from internal employees, which is supported by the data: “You have to say that [...] ideas emerge from internal or external” (Expert A); “... we say that our parent company should profit from start-ups” (Expert G); “...the [incubator program] is designed for internal staff” (Expert E); “We will only allow topics into our incubator that can be handled by ourselves. Currently our incubator does not support external start-ups” (Expert D).

The last sub-category of pre-incubation describes the selection of incubator tenants. Interviewed experts highlight this critical success factor: “The most important factor refers to the team itself, the team is more important than the idea” (Expert G); “... but one important aspect is the team. The team is essential for the incubator decision.” (Expert H). Several criteria of this sub-category are identified as important for successful incubation: decision-making committee and selection criteria. The role of the decision-making committee has been confirmed by practice: “[...], this means we build a shark tank, a new committee for deciding what ideas may enter the incubator, which will be strongly represented by the board” (Expert D); “At the end there will be a pitch jury where professional experts take a look at the ideas that have to be presented in person” (Expert E); “We have a financial committee in case of financial investments that makes the final decision” (Expert A). In general, a jury of experts decides whether ideas are accepted into the incubator program or not. These experts mostly represent high-ranking executives who have a deep knowledge about innovation and the context of the idea. The selection of incubator tenants also plays a decisive role and corporations define individual selection criteria for their corporate incubators: “We have a set of 13 criteria - you can also call them KPI - after which we

evaluate such ideas that will be incubated. This includes topics such as: how big is the market potential, how does the idea fit into our corporation, what assets of our corporation are available to approach this business, how can we use our brand to support the idea, how is the scalability of the idea, does the idea have the potential to reach hundreds of millions? We need to have the knowledge about them in order to make a decision” (Expert D); “That is what we look at: team, market and the connection with the parent company. Without the collaboration with our parent company, the start-ups do not have to start [our incubator program]” (Expert G); “The jury’s decision is based on three criteria: the idea of course, the team and the pitch” (Expert E); “The most important [criterion] is the team behind the idea” (Expert C). In the context of idea selection, the collaboration between the incubator and the parent company seems to be significant. Furthermore, most interviewed experts regard the team of potential incubator tenants as a decisive success factor. The idea’s market potential and its fit with the corporate business area is also heavily weighted, even though the idea does not necessarily have to match the business focus of the corporation: “More or less than 20% of start-ups that we support do not have to conform with the strategic goals of our parent company. They should but they do not have to” (Expert G).

B. Incubation

The second proposed category refers to incubation, which is divided into the sub-categories incubator program and resource allocation. The incubator program contains the duration and the content provided to the tenants. The duration is further explained by the experts: “Basically we apply a stage-gate-process within the incubator, which contains three main steps. The first one refers to building a “minimum viable product”, the second is the alpha launch and the third would be the beta launch before the commercialization of the idea. This process should take between six to nine months on average. This does not mean that the venture has to leave the incubator immediately, it can for sure remain within the incubator and conduct first steps of commercialization through the incubator” (Expert D). In general, the duration of the incubator program varies with respect to the corporate incubator and can be extended by the tenants in some cases: “Some of them [tenants of the program] stay quite long some have been there for over two years.” (Expert B); “The actual phase of incubation should be finished between six and nine months” (Expert D); “[...] we thought that there will be an ideation phase of 1-2 months, where they can invest their own time also on the weekend. And afterwards a fixed program of three months [follows]” (Expert D). The content of the incubator program is also mentioned as a critical factor: “It is quite flexible and it really depends on the start-up company. Each company is at a different stage, each is developing different technologies” (Expert B). Accordingly, the process and the content of a corporate incubator should be very flexible with respect to the individual incubator tenants, as they find themselves in different development stages. Furthermore, an incubator program contains several milestones, as mentioned by one of the experts: “Basically we apply a stage-

gate-process within the incubator, which contains three main steps” (Expert D).

The second sub-category of incubation incorporates resource allocation, which is supported by empirical data: “Important is that the start-ups define what they need and that we provide this in good quality” (Expert G); “Our incubator offers all services that are required for the development of digital business models. And this is in the first place expert know-how of people who can implement business ideas in the modern world. Hereby, we talk about venture architects who say: Ok, this idea fits to that and needs to be commercialized and has strategic potential. Also strategic designers who frame the product or the service together with the target group that it is accepted by the market and that it is customer-centric. Up to the people who are necessary for software programming and combine the connection with the hardware or a back-end. And people who are able to develop or code this software” (Expert D).

In connection with the required resources for incubation, the detected expert statements highlight essential criteria of this sub-category: coaching, network, business support and financing. The criterion coaching is confirmed through the following anchor examples: “We offer them help to develop their projects faster and this includes a new, nicer and more interesting work environment, which implies coaching as well” (Expert F); “[...] we are looking for internal and external service providers who support these sprint formats” (Expert H); “In addition, mentoring which means each of our start-ups receives an external and an internal (internal means parent company) successful founder from the start-up ecosystem for support and coaching [...]” (Expert G). Resulting from these statements, it is suggested that coaching is conducted by external and/or internal experts in order to support the incubator tenants individually throughout the program. Furthermore, start-up methodology is imparted for further developing the tenants’ business model: “Design thinking workshops, business model canvas, prototyping and so forth [...]” (Expert H); “Each team receives a trainer who teaches the respective start-up methods, such as design thinking, business model canvas, etc.” (Expert E). Another criterion of resource allocation refers to the network: “I mean one of the attractive features that the companies like about the incubator is the opportunity to get experts’ advice [...] If we know what type of expertise they are looking for, we can identify scientists internally and put them in contact with them” (Expert B). The incubator tenants can benefit from the internal and external network of the corporate incubator, as they are connected with experts or customers of the parent company: “[...] this is one of the most important benefits that we provide to start-ups; to connect with internal and external customers of our firm [...]” (Expert F). In addition, another important resource refers to business support: “[...] this includes business support for these nine months where they get office space downtown provided by us” (Expert G); “[...] that he can provide the right materials. We call this a support function or enabling function – all functions that you need to further develop your project free from cares” (Expert D). In some cases, incubator tenants need to pay a small fee in order to receive business support, such as office space: “and they just

pay rent for laboratory space and office space and we provide basic services” (Expert B). The final proposed criterion in connection with resource allocation relates to financing. This critical success factor is also highlighted by the experts, even though not all consider financial factors as essential: “Money is not really the point here. More important is availability or time that is required for getting it running” (Expert E). Other experts mention that their corporate incubators provide a financial investment to their teams and financing in the start-up is important: “At the beginning we think about the investment you might need [...]” (Expert H); “[...] we are only investor” (Expert A). Some corporate incubators make an investment at the beginning of the incubation phase, which is either paid back by the incubator tenants during the incubator program or converted into shares at the end: “It is really more a bundle loan, which means they get money that we invest in the first place. And after two years, this debt is converted into company shares. And these company shares have been pre-defined in advance. In most cases this refers to 7-10 %” (Expert G). Altogether, the conducted analysis reveals, that the criterion of financing contains a wide variety of approaches depending on the objective of the corporate incubator.

C. Exit

The third main category of the corporate incubator operator model defines the exit phase. Thereby, it is suggested to distinguish between internal ideas and external start-ups. The empirical data offers an insight into the different exit options applied: “There are many options for the exit after an internal incubation” (Expert E). The first criterion for internal ideas refers to a spin-off, which describes the transformation of an internal idea into a new subsidiary of the parent company: “The second [option] is that actually a new business model emerges that we control by the parent company through a separate independent Ltd.” (Expert D). The second exit option is described as the integration into the parent company of the corporate incubator: “The idea is then implemented into existing business units. For example, if it refers to mobility, the idea is docking our mobility services. If it relates to product topics, it will be connected to research and development or sales” (Expert D). Besides the first two mentioned options, another proposed criterion refers to the sale of an incubated idea: “Up to the total sale, where we do not want to be a part of what has been developed through the incubation program” (Expert D). In contrast, external start-ups reveal different exit options after successful incubation including: acquisition of the start-up, purchase of shares in the start-up or the establishment of a supplier contract between the start-up and the corporation. All presented criteria are confirmed and further explained by empirical data. “And what can happen is that we say: Your idea is so interesting that we invest in you. Or we like you that much that we want to buy you” (Expert A). This citation highlights that a financial investment, as mentioned in the category of resource allocation, might result in an acquisition of the incubated start-up. The purchase of shares in a new venture is also supported by the experts’ experience: “[...] we also take equity, which means we take company shares of the start-ups that we support” (Expert D). Finally, the criterion of supplier

contracts between the corporation and the start-up is confirmed: “Our major goal is to actually source the products. We do not want to make them our own but rather consider the start-ups as service providers for our parent company” (Expert G). This statement reveals that some corporations become customers of incubated start-ups after successful incubation. However, corporate incubators might also keep their investment in these start-ups: “[...] we are shareholders as well as customers at the same time” (Expert G).

D. Additional criteria for a corporate incubator operator model

In connection with the defined research question of this study, additional criteria with high relevance for a corporate incubator operator model represent a result of the conducted qualitative content analysis. These additional criteria have been neglected by existing incubator literature and include: 1) the integration of the corporate incubator into the parent company, and 2) the involvement of corporate employees.

According to the interviewed experts, the organizational integration of the corporate incubator into the parent company represents a decisive aspect. In this context, empirical data reveal that corporate incubators should represent an independent legal entity that is strongly connected with high-level executives of the parent company: “On paper we are a completely independent Ltd., which is a 100% subsidiary of the parent company. We are directly placed in the organizational chart of the parent company right under the executive board and the CEO because we need to collaborate closely. The strategy is mainly defined by our CEO and we are basically the ones who need to follow this strategy and to determine how to fulfil it. And it is a lot easier if we are placed directly under the board instead of any small department” (Expert G). The decision of implementing a corporate incubator as a separate legal entity is supported by the benefit of shorter processes and faster decision-making: “[...] there are just processes that take forever, this is not a secret, it is the case for every large corporation. So fast decisions and acting quickly are the main benefits of founding a completely independent Ltd.” (Expert G).

The second additional critical success factor refers to the involvement of corporate employees into the incubation process, which might occur by the aid of several instruments: “By following the standard procedure, the ideas are collected through or crowdsourcing platform where corporate employees have been invited to. They can participate also as teams who found each other on this platform around an idea. And then they applied with this idea via a pitch” (Expert E). By using the instrument of an idea platform, internal employees can be involved in the process of idea generation and idea selection. “Our platform contains three different steps and as an incentive for our employees to make an effort, we provide corresponding goodies” (Expert E). In order to reinforce employee participation in such platforms, corporations make use of certain incentives and competitions. Furthermore, corporate employees might be involved in the corporate incubator as coaches or experts and thereby support the incubator program by their know-how: “One of the attractive features that the

companies like about our incubator is the opportunity to get expert advice from our scientists” (Expert B); “[...] we have set ourselves the goal to include as many of our employees as possible. Either by collaboration with start-ups or by providing workshops” (Expert B). Accordingly, these two additional criteria play an important role in particular within the first two phases of the corporate incubator operator model.

Resulting from the conducted literature review and findings from the qualitative content analysis of the empirical data, the following corporate incubator operator model is proposed (see Fig. 1).

In alignment with the presented categories and criteria derived from the conducted qualitative content analysis of the expert interviews, the suggested model provides an overview about the mentioned relevant sub-categories of the three incubation phases pre-incubation, incubation and exit (see also table 2). This holistic illustration has the aim to provide a framework for designing and implementing a corporate incubator.

V. CONCLUSION

This article analyzed existing incubator models and theoretical approaches derived from prior studies in order to develop categories for a corporate incubator operator model. Due to a limited consideration of a holistic framework including critical success factors for corporate incubators, the presented analysis incorporated a qualitative content analysis of eight semi-structured expert interviews. Based on the findings, the authors suggest a corporate incubator operator model that includes the following three phases: pre-incubation, incubation, and exit. Pre-incubation describes several sub-categories such as diagnosis of needs, origin of ideas or selection of tenants.

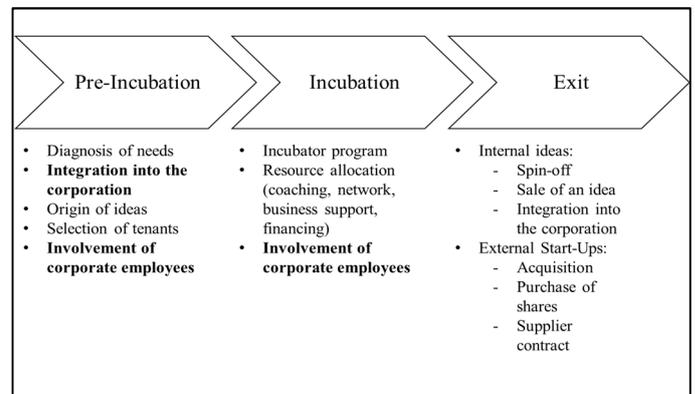


Fig. 1. Corporate incubator operator model.

The incubation phase sums up the incubator program, as well as resource allocation. Finally, the exit phase is divided into internal and external factors. Internal ideas might be spun-off, sold or integrated into the corporation, while the incubation of external start-ups might result in acquisition, purchase of shares or a supplier contract between the two parties. In this context, the additional criteria integration into the parent company and involvement of corporate employees represent valuable findings that require further research. The limited number of interview partners might be supplemented by further testing the proposed operator model in future studies with a higher number of

involved experts from different sectors. As the suggested model was developed for corporate incubators in particular, an assignment to other types of incubators might reveal further critical success factors. Another future research approach might refer to an analysis of regional differences of corporate incubator operator models. In conclusion, it is suggested that corporations make use of the corporate incubator operator model for a successful implementation.

REFERENCES

- [1] Porter, M., "Competitive Advantage", The Free Press, NY, 1985.
- [2] Gaida, K., "Erfolgreiche Business Inkubation mit neuen Internet-Tools.", Gabler: Wiesbaden, 2011.
- [3] Weiblen, T. and Chesbrough, H. W., "Engaging with Startups to Enhance Corporate Innovation", in California Management Review, 57/2, 2015, pp. 60-90.
- [4] Alberti, J., "Geschäftsmodelle für Inkubatoren: Strategien, Konzepte, Handlungsempfehlungen (Innovation und Technologie im modernen Management).", Gabler: Wiesbaden, 2010.
- [5] Hansen, M. T.; Chesbrough, H. W.; Nohria, N. and Sull, D. N., "Networked Incubators: hothouse of the new economy", in Harvard Business Review, 78/5, 2000, pp. 74-84.
- [6] Seidel, V., "Frontiers of Entrepreneurship Research 2001, Babson, MA, Babson College, 2001.
- [7] Colombo, M. G. and Delmastro, M., "How effective are technology?: Evidence from Italy", in Research Policy, 31, 2002, pp. 1103-1122.
- [8] Allen, D. N. and McCluskey, R., "Structure, policy, services, and performance in the business incubator industry.", in Entrepreneurship Theory and Practice, 14, 1990, pp. 61-77.
- [9] Phan, P. H.; Siegel, D. S. and Wright, M., "Science parks and incubators: observations, synthesis and future research.", in Journal of Business Venturing, 20/1, 2005, pp.165-182.
- [10] Bergek, A. and Norman, C., "Incubator best practice: A framework", in Technovation, 28/1, 2008, pp. 20-28.
- [11] Lalkaka, R. and Bishop, J., "Business Incubators in Economic Development – an initial assessment in industrialising countries.", New York: United Nation Development Programme, 1996
- [12] Peters, L., Rice, M. and Sundararajan, M., "The role of incubators in the entrepreneurial process", in Journal of Technology Transfer, 29/2, 2004, pp. 83-91.
- [13] Stephens, S. and Onofrei, G., "Measuring business incubation outcomes An Irish case study", in International Journal of Entrepreneurship and Innovation, 13/4, 2012, pp. 277-285.
- [14] Lewis, D.A., "Does technology incubation work: A critical review of the evidence", Washington, DC: US Department of Commerce Economic Development Administration, 2001.
- [15] Adkins, D., "A Report for the Japan Association of New Business Incubation Organizations (JANBO): Summary of the U.S. Incubator Industry", Athens, OH, National Business Incubation Association, 2001.
- [16] Achleitner, A. and Engel, R., "Der Markt für Inkubatoren in Deutschland: Eine empirische Studie." European Business School: Oestrich-Winkel, 2001.
- [17] Klonowski, D., „Business Incubation and Its Connection to Venture Capital“, in Venture Capital: Investment Strategies, Structures, and Policies, Cumming, D. J., Eds., Hoboken, John Wiley & Sons, 2010, pp. 111-129.
- [18] Gaida, K., "Erfolgreiche Business Inkubation mit neuen Internet-Tools.", Gabler: Wiesbaden, 2011.
- [19] Bhabra-Remedios, R. K. and Cornelius, B., "Cracks in the Egg: improving performance measures in business incubator research." Small Enterprise Association of Australia and New Zealand 16th annual Conference, Ballarat, 2003.
- [20] Von Zedtwitz, M., "Classification and management of incubators: aligning strategic objectives and competitive scope for new business facilitation", in International Journal of Entrepreneurship and Innovation Management, 3/ 1, 2003, pp. 176-196.
- [21] Von Zedtwitz, M., "Managing incubators: challenges for industrial companies, Universities, and Government to improve new business facilitation", in Proceedings of the International Conference on Entrepreneurship and Learning, Mitra, L. and Corti, E. (Eds.), Napoli, June 21-24.
- [22] Spath, D. and Walter, A., "Mehr Innovationen für Deutschland. Wie Inkubatoren akademische Hightech-Ausgründungen besser fördern können (acatech STUDIE)", Heidelberg u.a.: Springer Verlag, 2012.
- [23] Engelmann, A., "Das Inkubationsprinzip – ein ganzheitlicher Ansatz zur Unterstützung der Existenzgründung.", in: Finanz-Betrieb, 2000.
- [24] Becker, B. and Gassmann, O., "Gaining leverage effects from knowledge modes within corporate incubators.", Blackwell Publishing Ltd. 2006: Oxford, England., 2006.
- [25] Roberts, E. B., "New ventures for corporate growth", in Harvard Business Review, 58/4, 1980, pp. 134-142.
- [26] Smilor, R. W., "Managing the Incubator System: Critical Success Factors to Accelerate New Company Development." IEEE Transactions on Engineering Management, 34/3, 1987, pp. 146-155.
- [27] Abetti, P.A., "Government-Supported Incubators in the Helsinki Region, Finland: Infrastructure, Results, and Best Practices.", in The Journal of Technology Transfer, 29/1, 2004, pp. 19-40.
- [28] Gerlach, S. and Brem, A., "What determines a successful business incubator?: Introduction of an incubator guide", in International Journal of Entrepreneurial Venturing, 7/3, 2015, pp. 286-307.
- [29] Voisey, P., Gornall, L., Jones, P., and Thomas, B., "The measurement of success in a business incubation project", in Journal of Small Business and Enterprise Development, 13/3, 2006, pp. 454-468.
- [30] Unal, O., Afsarmanesh, H. and Angelov, S., "An Agile Innovation Framework Supported through Business Incubators", in PRO-VE 2014, IFIP AICT 434, 2014, pp. 307-316.
- [31] Hackett, S. M. & Dilts, D. M., "A Systematic Review of Business Incubation Research.", in The Journal of Technology Transfer, 29/1, 2004, pp. 55-82.
- [32] Lumpkin, J.R. and R.D. Ireland, "Screening Practices of New Business Incubators: The Evolution of Critical Success Factors", in American Journal of Small Business, 12/4, 1988, pp. 59-81.
- [33] Clarysse, B., Wright, M., Lockett, A., van de Velde, E., Vohora, A., "Spinning off new ventures: A typology of incubations strategies from European research institutions", in Journal of Business Venturing, 20, 2005, pp. 165-182.
- [34] Chan, K. F. and Lau, T., "Assessing technology incubator programs in the science park: the good, the bad and the ugly.", in Technovation, 25/10, 2005, pp. 1215-1228.
- [35] Lyons, T. S. and Li, S., "The State of the Wisconsin Incubation Industry in 2002: An Analysis of the Results of the Survey of Membership" No: Issue, 2003.
- [36] Mian, S. A., "Assessing value-added contributions of university technology business incubators to tenant firms." , in Research Policy, 25/3, 1996, pp. 325-335.
- [37] Bollingtoft, A. and Ulhøi, J. P., "The networked business incubator--leveraging entrepreneurial agency?", in Journal of Business Venturing, 20/2, 2005, pp. 265-290.
- [38] Rice, M. P., "Co-production of business assistance in business incubators: an exploratory study.", in Journal of Business Venturing, 17, 2002, pp. 163-187.
- [39] Merrifield, D. B. "New Business Incubators.", in Journal of Business Venturing, 2/3, 1987, pp. 277-284.
- [40] Brooks, O. J., "Economic Development Through Entrepreneurship: Incubators and the Incubation Process.", in Economic Development Review, 4/2, 1986, p. 24.
- [41] Grimaldi, R. and Grandi, A., "Business incubators and new venture creation: an assessment of incubating models.", in Technovation, 25, 2005, pp. 111.121.

- [42] Collinson, S. and Gregson, G., "Knowledge networks for new technology-based firms: an international comparison of local entrepreneurship promotion.", in *R&D Management*, 33/2, 2003, pp. 189-208.
- [43] Scott, W. R., "Institutions and Organizations." Sage Publications Thousand Oaks, 1995.
- [44] Gompers P. and Lerner, J., "The Venture Capital Cycle", Cambridge: MIT Press, 1999.
- [45] Lerner, J., "Assessing the Contribution of Venture Capital to Innovation", in the *RAND Journal of Economics*, 31/4, 2000, pp. 674-692.
- [46] Campbell, C.; Kendrick, R. & Samuelson, D., "Stalking the Latent Entrepreneur.", in *Economic Development Review*, 3/2, 1985, pp. 43-48.
- [47] Gläser, J. and Laudel, G., "Experteninterviews und qualitative Inhaltsanalyse", Springer VS: Heidelberg, 2010.
- [48] Mayring, P., "Qualitative Inhaltsanalyse, Grundlagen und Techniken", Beltz: Weinheim, 2010.