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Anna Bergek and Charlotte Norrman

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Incubator best practise: A framework

Anna Bergek* & Charlotte Norrman
Department of Management and Engineering
Linköping University
SE-581 83 Linköping
Sweden

E-mail: annbe@eki.liu.se; chano@eki.liu.se
Telephone: +46-(0)13-28 25 73; +46-(0)13-28 25 38
Fax number: +46-(0)13-28 18 73

*Corresponding author

Abstract

Incubators have become a ubiquitous phenomenon in many parts of the world and are viewed as a tool for promoting the development of technology-based growth firms. Considering the large faith and the considerable amounts of money invested in incubators, the identification of best practice incubator models is of importance. Previous incubator assessment literature has tended to emphasise the measurement of incubator outcomes. In this paper, we argue that best practise identification requires a holistic approach, where the goals of the incubators are taken into account and the performance of different incubators are put in relation to their incubator models. In this context, the aim of this paper is to develop a framework that can serve as a basis for identifying best practice incubator models and for more rigorous evaluations of incubator performance. The framework suggested includes three distinguishing model components: selection, business support and mediation. We distinguish between idea-focused selection and entrepreneur-focused selection as well as between “picking-the-winners” and “survival-of-the-fittest” selection. Business support is seen as a continuum from “laissez-faire” to “strong intervention”. Mediation strategies vary in terms of the type of innovation system in focus: technological, regional or cluster. The framework is applied to 16 Swedish incubators.

Keywords: Incubator, performance, best practice, incubator model, selection, business support, mediation

1. Introduction

The concept of ‘incubator’ is often used as an overall denomination for organisations that constitute or create a supportive environment that is conducive to the “hatching” and development of new firms (Chan and Lau, 2005, p. 12; Lindholm-Dahlstrand and Klofsten, 2002; Lyons and Li, 2003; VINNOVA, 2004). Such incubators have become a ubiquitous phenomenon in many parts of the world. Policy makers on national and local levels have come to view them as a tool for promoting economic development, innovativeness and the emergence of new technology-based growth firms. They are used as vitamin injections for ‘tired’ regions and as contraction-stimulators or painkillers in the birth of university spin-offs.

Considering the great credence for – and the large amounts of money invested in – incubators by governments, universities, research institutions, municipal agencies and other interested parties, the question of what return society gets on these investments has been raised. Consequently, and in line with a general demand for more rigorous evaluations (OECD, 2006), the evaluation of incubator performance has attracted some attention (cf. Aernoudt, 2004; Allen and McCluskey, 1990; Bhabra-Remedios and Cornelius, 2003; Chan and Lau, 2005; Grimaldi and Grandi, 2005; Hackett and Dilts, 2004a; Lindelöf and Löfsten, 2004; Mian, 1996a; Mian, 1997; Nolan, 2003; OECD, 1997; cf. Pena, 2004; Phan et al., 2005).

According to our knowledge, Allen and McCluskey (1990) provided the first systematic overview of incubator performance literature. They identified the need for increased conceptual clarity with regard to incubator development in general and incubator performance in particular. During the 1990s, several researchers attempted to address

the issue of incubator performance, but no single evaluation framework was developed (Mian, 1997). Since then, several researchers have discussed the importance of relating performance to the activities of the incubators in order to identify best practices (cf. Autio and Klofsten, 1998; Colombo and Delmastro, 2002; Hannon, 2003; Mian, 1997). However, according to later reviews, there is still a lack of "... a complete evaluation framework ... that will allow for benchmarking activities and outcomes" (Bhabra-Remedios and Cornelius, 2003, p 12).

This paper deals with two of the remaining problems. First, there does not seem to be much consensus with regards to the definition of 'performance' and how it should be evaluated and compared (Nolan, 2003; Phan et al., 2005). This might be one explanation why the opinion on whether business incubation is an effective business development tool differ (Bollingtoft and Ulhøi, 2005; cf. Pena, 2004). Second, most of these studies have focused on outcome (e.g. number of new firms, jobs and firm survival), but without relating it to how different incubators organise and manage their incubation processes. This implies that the incubator model has been treated like a "black box". In order to identify best practice, this black box has to be opened. This would also enable more rigorous performance evaluations since the model needs to be controlled for: "evaluation of performance or outcomes requires that the alternative programs are relatively well defined, with substantially similar aims but *clearly differentiated strategies for attaining them*" (Mian, 1997, p. 261, our emphasis).

In summary, there is a lack of a theoretical base for incubator performance evaluation in general and the identification of best practises in particular. *The aim of this paper is, therefore, to develop a framework that can serve as a basis for identifying best practice*

incubator models. This framework can be used as a tool both for policy makers' resource allocation decisions and for those involved in incubator activities at the practical level. The latter refers both to incubator managers (designing incubator models), incubator stakeholders (deciding which incubator(s) to finance/support) and entrepreneurs/idea owners (deciding which incubator to apply to).

The paper is outlined as follows. In section 2, we define the concept of 'incubator'. Section 3 reviews the previous literature on incubator best practise evaluation and identifies some problems with the current focus on outcome indicators. In section 4, we present a framework allowing us to describe and distinguish between different incubator models, which we apply to a number of Swedish incubators. Finally, sections 5 and 6 present our conclusions and some suggestions for further research.

2. In search of a definition of 'incubator'

Generally an incubator can be viewed as "... a support environment for start-up and fledgling companies" (Peters et al., 2004, p. 83). In the incubator literature, a large number of detailed and in many ways similar definitions have been put forward (for a detailed overview see Hackett and Dilts (2004b)). Four components have received particular attention in previous research (see Aernoudt, 2004; Allen and McCluskey, 1990; Bollingtoft and Ulhoi, 2005; Brooks, 1986; Chan and Lau, 2005; Clarysse et al., 2005; Collinson and Gregson, 2003; Colombo and Delmastro, 2002; Hackett and Dilts, 2004a; Hackett and Dilts, 2004b; Hansen et al., 2000; Hsu et al., 2003; Lyons and Li, 2003; Mian, 1996a; Nolan, 2003; Peters et al., 2004; Phillips, 2002; Rice, 2002; Rothschild and Darr, 2005; Smilor, 1987; von Zedwitz, 2003).

- (1) shared office space, which is rented under more or less favourable conditions to incubatees,
- (2) a pool of shared support services to reduce overhead costs,
- (3) professional business support or advice (“coaching”) and
- (4) network provision, internal and/or external.

In the incubator literature, the relative emphasis on each component has varied over time, from an initial focus on facilities and administrative services to a more recent emphasis on the importance of business support (Peters et al., 2004). In our opinion the latter is the most important – without business support activities, the denomination “hotel” is a better description than incubator – but we nevertheless cannot agree with those who argue that co-location is not a necessary feature of an incubator (e.g. Nolan, 2003; von Zedwitz, 2003). In contrast, we are convinced that the use of shared localities is an important advantage, since it besides shared overhead resources also provides opportunities for knowledge transfer and experience sharing between the incubatees (see also Lewis, 2001).

Despite the apparent similarities between different definitions, the incubator concept has shown to be anything but clear in practice. First, there is disagreement with regards to whether an incubator is an organisation or a more general entrepreneurial environment: “... there has been a recurring problem of definitions in which science parks and incubators can encompass almost anything from distinct organisations to amorphous regions” (Phan et al., 2005, p. 168). We choose to reserve the concept of incubator for *organisations* dedicated to the support of emerging ventures.

Second, it is often unclear which part of the venture development process is considered. Some researchers seem to treat incubators and technology/science parks as synonymous (cf. Lindelöf and Löfsten, 2004) and distinguish between different types of incubators based on the development stage of their incubatees: start-ups, business development or maturity (Bhabra-Remedios and Cornelius, 2003). However, most researchers seem to agree that incubation is related to the early phase of a ventures life (see, e.g., Aernoudt, 2004; Bhabra-Remedios and Cornelius, 2003; Grimaldi and Grandi, 2005; Hackett and Dilts, 2004a; Lindelöf and Löfsten, 2004). We agree that most incubators take on ventures in early phases, whose ideas are immature, i.e. have not yet been fully developed into business ideas (cf. Klofsten, 2005), and help develop them into viable companies. This corresponds well to the conclusion of Brooks (1986) that incubation should be aimed at bridging or closing the gap between the new venture idea and “the attempt stage”. Consequently, the incubator concept should not be used for organisations such as science parks and technology parks, which are generally designed for the support of more mature firms.

In summary, in this paper the concept of incubator is reserved for organisations that supply joint location, services, business support and networks to early stage ventures.

3. Incubator best practise identification: Basic principles and previous research

Best practise may be defined as a process that is better at delivering a particular result than any other process. The word ‘better’ may be understood in two different ways: effectiveness/performance, i.e. whether the right things are done, and efficiency, i.e. whether the things done are done properly (cf. Mosselman et al., 2004). In this paper, we focus on the former.

In the evaluation literature, the concept of ‘performance’ usually refers to the goal attainment of an activity or scheme (cf. Mosselman et al., 2004). This implies that it is not enough to measure the outcome of an activity – this outcome also needs to be related to *expected* outcomes (i.e. goals) (Storey, 2000; Vedung, 1998). In line with this, we define incubator performance as the extent to which incubator outcomes correspond to incubator goals. In order to identify incubator best practise, the performance of different incubators should, then, be related to their ‘incubator models’, i.e. to how they organise and manage the incubation process.

To conclude, the identification of best practise incubator models requires us to describe and distinguish between different incubator models and to measure their outcomes in relation to their goals (see Figure 1).

FIGURE 1 IN ABOUT HERE

Previous research has focused primarily on identifying suitable criteria and indicators to measure outcomes. For example, in a study of 127 US incubators Allen and McCluskey (1990) used three criteria: occupancy, jobs created and firms graduated. In addition to these, Phillips (2002) included indicators such as tenant revenues, number of patent applications per firm and number of discontinued businesses in her comparison between different types of incubators in the US. These are only a couple of examples of the larger number of papers identifying lists of outcome criteria (cf. Chan and Lau, 2005; Colombo and Delmastro, 2002; OECD, 1997). Perhaps the most comprehensive list was provided by Mian (1996a; 1996b; 1997), who added management policies and their effectiveness as well as services and their value added to the list of ‘ordinary’ outcomes. Few studies, however, put these outcome indicators in relation to goals. Instead,

incubators are usually examined as if they have the same outcome objectives (Bears, 1998; Sherman, 1999), regardless of the fact that “no two incubators are alike” (Allen and McCluskey, 1990, p. 64), that incubators “articulate objectives differently depending upon their sponsor’s interests” (Mian, 1996b, p. 194) or at least make “different priorities” within the same basic goals (Bollingtoft and Ulhoi, 2005), and that “goals vary from one organisation to another” (Bhabra-Remedios and Cornelius, 2003, p. 11).

This failure to take goals into account is problematic in two ways. First, it follows from the definition of performance that that comparisons should, preferably, only be made between incubators that have the same goal(s). At the very least evaluators should weight outcome indicators differently for different classes of incubators based on their goals (Bears, 1998). Second, different goals correspond to different outcome indicators. For example, if the goal is to create jobs, a suitable indicator is number of employees, whereas growth in sales might be a better indicator for an incubator striving to commercialise research ideas. Thus, although most of the indicators and criteria described above have their uses and are valuable in the right context, they need to be chosen with care on the basis of the goals of the studied incubators. To further complicate things, incubators may have multiple goals. To a large extent, this is due to the fact that incubators may have multiple stakeholders with differing interests (OECD, 1997).

In principle, it is not difficult to distinguish between incubators with different goals. Regardless of whether incubators are run for profit or not for profit (Bollingtoft and Ulhoi, 2005; Lyons and Li, 2003; Peters et al., 2004), they may have two main types of

goals: (a) enhancing economic development and/or reduce unemployment in a region by facilitating the start-up of new companies, increasing their survival rate and growth and, more generally, by training entrepreneurs, and (b) stimulating firms involved in emerging technologies or the commercialisation (or transfer) of research done in universities, research institutes and firms (see, e.g., Bhabra-Remedios and Cornelius, 2003; Mian, 1997; Nolan, 2003; OECD, 1997; Peters et al., 2004; Phillips, 2002; Sherman, 1999). These categories are, however, a bit too crude to be used in detailed empirical analyses and we therefore recommend researchers to follow the advice of Bearse (1998) and let goal categories fall out of the data.

It may, perhaps, be argued that the goal of the incubator may be irrelevant for the evaluator and that the outcome in itself, thus, is a good enough measure. For example, policy makers that are interested in job creation would presumably be satisfied with identifying those incubators that produce the largest number of jobs, regardless of whether this is the incubators' goal or not. However, as mentioned above outcome descriptions are of limited value when it comes to identifying best practice. If we fail to control for differences in incubator goals, we cannot tell whether differences in outcomes are, in fact, the result of differences in practices or merely of differences in focus between incubators.

With respect to differences in incubator models, it is interesting to note that the issues of how incubator support is currently provided and how incubators differ in this respect have so far received much less attention than the outcome of the support. It is a fragmented picture of the organisation and management of the incubation process that emerges from the previous literature. The aim of the following section is therefore to

develop framework that enables us to describe differences between incubator models. We will also apply this framework on a number of Swedish incubators as an empirical example.

4. Describing incubator models: A framework

As mentioned above, little has been written with regards to incubator models, i.e. how and in what way incubators provide their support. From the reviewed literature, we can however discern what seem to be the main incubator model components (see Hackett and Dilts, 2004b; Peters et al., 2004; Soetanto, 2004). *Selection* refers to decisions concerning which ventures to accept for entry and which to reject. *Infrastructure* consists of localities, office facilities and ‘administrative’ services. *Business support* is associated with coaching/training activities undertaken to develop the incubatees. *Mediation* refers to how the incubator connects the incubatees to each other and to the outside world. Finally, *graduation* is related to exit policies, i.e. decisions concerning under what circumstances incubatees should leave the incubator.

However, not all of these are equally important when separating different incubator models from each other. Judging from earlier research, most incubators seem to supply more or less the same set of general administrative services, including shared office space and equipment as well as facilities-related services and office services such as reception and clerical services (Bollingtoft and Ulhøi, 2005; Chan and Lau, 2005; Colombo and Delmastro, 2002; Lalkalka, 2003; Lyons and Li, 2003; Mian, 1996a; Rice, 2002). Furthermore, we have not seen any reference in the literature to substantial differences with respect to graduation policies. According to CSES (2002), most incubators have formal exit rules requiring incubatees to leave the incubator after 3-5

years. We, therefore, suggest that selection, business support and mediation are the main distinguishing components of incubator models (see Figure 2).

FIGURE 2 IN ABOUT HERE

4.1 Selection

According to Hackett and Dilts (2004b), most of what has been done concerning incubator models is related to the issue of incubatee selection. Researchers seem to agree that selection is an important incubator management task (e.g. Colombo and Delmastro, 2002; Lumpkin and Ireland, 1988; Peters et al., 2004), since it is the basis for effective resource allocation, with respect both to individual incubators (Lumpkin and Ireland, 1988) and to the general economy (Hackett and Dilts, 2004b). The task of identifying firms that are “weak-but-promising”, while avoiding those that cannot be helped through business incubation as well as those that do not need incubation, is a challenge which requires “a sophisticated understanding of the market and the process of new venture formation” (Hackett and Dilts, 2004b, p. 61; cf. also Lumpkin and Ireland, 1988).

Opinions differ, however, with regards to what the appropriate selection criteria are, which perhaps explains why different incubators put different emphasis on different criteria (cf. Lumpkin and Ireland, 1988). Available options include the prior employment experience and technical expertise of the entrepreneur or the venture team, the properties of the market the venture is aiming at, the properties of the product or service and the profit potential of the venture (Hackett and Dilts, 2004b). In principle, these may be divided into two overall approaches: selection focused primarily on the idea and selection focused primarily on the entrepreneur or the team. In order to pursue

an idea-focus approach, incubator managers must have access to deep knowledge in relevant technological fields in order to evaluate the viability of ideas, i.e. the product, the market and the profit potential related to the combination of these. The entrepreneur-focus approach, in contrast, requires the ability to judge personality as well as the knowledge of more general business development requirements in relation to which the experience, skills, characteristics and driving forces of entrepreneurs may be evaluated.

However, selection is not only a matter of criteria – it is also a matter of flexibility or strictness in applying them. We may here distinguish between two basic approaches. In the “picking-the-winners” approach, incubator managers try to identify a few potentially successful ventures *ex ante*. When this approach is taken to its extreme, incubators resemble private venture capital firms. In the “survival-of-the-fittest” approach, incubator managers apply less rigid selection criteria, take on a larger number of firms and rely on markets to provide the selection processes that over time will separate winners from losers. These approaches have some common features with the different “models of spinout activities” discussed by Clarysse et al. (2005)(2005).

If we combine these two types of approaches of the selection component, we get four “selection strategies” (see figure 3), which are likely to result in very different incubator “portfolios” of incubatees.

- *Survival-of-the-fittest & idea*. The portfolio will presumably consist of a quite large number of idea owners (or upcoming entrepreneurs) with immature ideas related to a broad spectrum of fields.

- *Survival-of-the-fittest & entrepreneur.* The resulting portfolio will be diversified, and consist of entrepreneurs/teams with strong driving forces representing a broad set of ventures.
- *Picking-the-winners & idea.* Results in a highly niched portfolio of thoroughly screened ideas within a quite narrow technological area – often sprung from the research of highly ranked universities.
- *Picking-the-winners & entrepreneur.* The portfolio consists of a few handpicked and carefully evaluated entrepreneurs, commonly with ideas coupled to the research areas of a nearby university.

FIGURE IN 3 ABOUT HERE

4.2 *Business support*

The importance of providing business support in addition to more general administrative services has been emphasised in recent incubator literature, and different researchers have made a number of descriptions of the types of services and support provided by incubators to incubatees. The business support services generally identified include entrepreneurial training and business development advice, as well as services concerning general business matters such as accounting, legal matters, advertising and financial assistance (Bollingtoft and Ulhoi, 2005; Chan and Lau, 2005; Lalkalka, 2003; Lyons and Li, 2003; Mian, 1996a). Those of most concern to us here are those related to business development and entrepreneurial training, including coaching and education related to business planning, leadership marketing and sales.

As has been noted by, e.g. Bhabra-Remedios and Cornelius (2003), the success of incubator tenants is not only dependent on the nature of these services, but also on how they are supplied. Hackett and Dilts (2004a) observe that business assistance approaches may differ with regards to time intensity (percentage of working hours devoted to monitoring and assisting incubatees), comprehensiveness (the degree to which assistance include strategic and operational assistance as well as administrative-related services) and degree of quality (the relative value of the assistance). A more general approach is that of Rice (2002), who distinguishes between different types of counselling: (1) Reactive and episodic counselling, which is entrepreneur-initiated – the entrepreneur requests help dealing with a crisis or problem and the assistance is focused on this problem and is generally of limited duration). (2) Proactive and episodic counselling, which is incubator-initiated – the manager engages entrepreneurs in informal, ad hoc counselling. (3) Continual and proactive counselling, which is incubator-initiated – the venture is subjected to an ongoing review and “intense-aggressive” intervention by incubator managers.

These categories differ in terms of who the initiator is (the entrepreneur or the incubator staff) and the support intensity or continuity. According to our opinion, what both these dimensions come down to in the end is the view of the incubator’s role in the incubation process. Incubators may, then, be placed on a scale depending on the extent to which they see themselves as managers of the incubation process or as external facilitators of a process primarily managed by the incubatees themselves. At the one extreme, which we call *strong intervention*, the ventures are guided through the incubation process by the steady hand of the incubator staff and are sometimes even supplied with complete management teams. To use a citation from Leleux (2001) “it is not lawn tennis at

Wimbledon; it is more like mud rugby at Landsdown Road. You are in the dirt with your entrepreneur all day long.” At the other extreme, which we call *laissez-faire*, incubatees are left entirely to themselves and are provided with very little assistance unless they choose to ask for it.

4.3 Mediation

The incubation process transcends the incubator (Hackett and Dilts, 2004a). One important incubator role is, therefore, to act as an intermediary – or mediator – between incubatees and relevant innovation systems (Peters et al., 2004). The incubator thereby provides a “bridge” between the incubatee and its environment (Merrifield, 1987), with the purpose of leveraging entrepreneurial talent and/or resources (Bollingtoft and Ulhoi, 2005; Grimaldi and Grandi, 2005). Critical resources include, e.g., knowledge and technology, financial capital, market related resources and human capital (see, e.g., Begley et al., 2005; Bollingtoft and Ulhoi, 2005; Hindle and Yencken, 2004; Mian, 1996a; Rice, 2002; Rickne, 2000).

Incubators may engage in *network mediation*, i.e. matching incubatees with other actors (Brooks, 1986; von Zedwitz, 2003), with the purpose of compensating for the incubatees’ lack of established entrepreneurial networks (Peters et al., 2004; Smilor, 1987; von Zedwitz, 2003). By using the concept of ‘network mediation’ instead of the more commonly used ‘networking’, we want to distinguish the intermediary role of the incubator from its activities to build a network from which it can source expertise for its business support activities.

Mediation networks may provide information, knowledge and expertise that are vital for the survival of new ventures and may also reduce the uncertainty they experience

(Collinson and Gregson, 2003). Networks can emerge between incubatees and external actors, such as potential customers, partners, employees, university researchers and financiers (cf. Bollingtoft and Ulhoi, 2005; Clarysse et al., 2005; Hackett and Dilts, 2004b). There is, however, also an ‘inherent’ potential for interaction between incubatees, which is of importance for, e.g., social capital building and the development of agglomeration economies (Aernoudt, 2004; Bhabra-Remedios and Cornelius, 2003; Bollingtoft and Ulhoi, 2005; Brooks, 1986; Collinson and Gregson, 2003; Colombo and Delmastro, 2002).

Incubators may also engage in *institutional mediation*, i.e. mediating the impacts of institutions on incubatees (Hackett and Dilts, 2004b). Through mediation, incubators may help incubatees to understand, interpret and perhaps even influence the institutional demands introduced by regulations, laws, traditions, values, norms and cognitive rules (cf. Scott, 1995). They may also increase the visibility, credibility and understandability of incubatees in the eyes of external actors, thereby helping incubatees obtain legitimacy and social acceptance (see also Bollingtoft and Ulhoi, 2005; Collinson and Gregson, 2003; Smilor, 1987; Suchman, 1995; Zimmerman and Zeitz, 2002).

There is evidence that some incubators’ mediation activities are limited to certain regions, whereas other incubators work on a more international scale within a limited technological field (cf. Carayannis and von Zedwitz, 2005; Clarysse et al., 2005). We, therefore, suggest that it is fruitful to distinguish incubators based on the type of innovation system they primarily connect to: regional (/national) innovation systems (RIS) or technological/sectoral innovations systems (TIS/SIS). In the case of cluster formation these two categories overlap. Until it has been verified through empirical

studies whether the technological or the regional dimension is the more important, we recommend that clusters be treated as a third category.

4.4 *Empirical application: The Swedish example*

As an empirical illustration, we will apply our framework on the 16 Swedish incubators that were supported by the government VINNKUBATOR-programme for incubator support (see Appendix A). This exercise is based on an analysis of the incubators' applications to this programme. This dataset is obviously limited and the analysis should, therefore, be seen as an illustration rather than as a test of the validity of the framework. We will first explore the three model dimensions separately and then describe a number of categories falling out of the data when we combine all the dimensions.

With regards to *selection*, we studied the selection criteria mentioned in each incubator's application. Six incubators had a clear focus on criteria related to the competence and character of the entrepreneur. We consider these to be entrepreneur-focused. Seven incubators primarily mentioned criteria related to the characteristics of the idea (e.g. innovativeness). We consider these to be idea-focused. The three remaining incubators put equal emphasis on criteria related to the idea and criteria related to the entrepreneur/team. Only one of the incubators had a survival-of-the-fittest approach to selection, where approximately 40 percent of the candidates were accepted. This incubator also had a significantly higher number of incubatees than the other incubators. All other incubators had a "picking-the-winners" approach. They described a rigorous evaluation process with multiple criteria and a high reject rate (over 80 percent in many cases). However, many of these incubators have a pre-incubation

process, here labelled “idea hatcher”, to which selection is based more on a survival-of-the-fittest approach where the idea and its qualification process is in focus.

We found three typical forms of *business support*. Four incubators were located at the lower end of the scale, with minor intervention that is initiated by the entrepreneurs. For two of the incubators, the data available in the applications were not sufficient to make a proper categorisation. A much stronger degree of intervention was found at three incubators, which acted as venture capital investors (including ownership of the firm and active participation in the management of the firm). In between these extremes were seven incubators that described their support system in terms of a structured step-wise programme, which incubatees are obligated to follow. For two of the incubators, the data available in the applications were not sufficient to make a proper categorisation.

With regards to *mediation*, three main strategies could be identified. Most incubators (11) described their main focus in terms of a geographically delineated innovation system, in most cases equal to the county/province in which they are located. Three incubators focused on technological innovation systems (e.g. the life science innovation system) and two incubators were directed towards regional innovation clusters (e.g. a packaging industry cluster).

Taking these dimensions together, five categories fall out. Within one of these (category 2), we have identified two sub-categories based on slight differences in the selection dimension (see Table 1).

TABLE 1 IN ABOUT HERE

A first observation from this empirical exercise is that the framework is applicable. Despite the fact that the information used for the categorisation was based solely on the applications, we were able to assess the incubators with respect to each component. It is particularly interesting to note that the resulting number of categories is limited and, that they – as far as our knowledge and experience of the studied incubators can tell – seem meaningful. The categorisation can, however, be further refined through more rigorous studies based on in-dept interviews.

A second observation is that practises differ among incubators with similar goals (e.g. creation of regional growth). This indicates that there are different opinions on how a certain goal should best be achieved – even among incubators that all were successful in obtaining government support. In order to determine whether one or another of these practises represents the most effective way to reach a certain goal, they need to be put in relation to relevant outcome indicators. Such an analysis may either result in the identification of one single best practise or in several equally effective practises.

5. Summary and conclusions

The aim of this paper was to develop a framework that could serve as a basis for identifying best practice incubator models.

Our review of previous incubator assessment literature revealed two problems. First, although previous researchers have been successful in identifying proper outcome indicators, they have not included goal differences between incubators in their analyses and have, thus, measured outcome rather than performance. We concluded that

comparisons should only be made between incubators that have the same goal(s) and that outcome indicators should be chosen carefully as to correspond to these goals.

Second, the issues of how incubator support is currently provided, i.e. which incubator models that are used, and how incubators differ in this respect is usually neglected. In order to remedy this problem, we developed a framework describing three incubator model components – selection, business support and mediation – according to which different incubators may be distinguished. With respect to *selection*, we put forward a four-field matrix consisting of the following strategies: “picking-the-winners & idea”, “picking-the-winners & entrepreneur”, “survival-of-the-fittest & idea” and “survival-of-the-fittest & entrepreneur”. We also suggest that *business support* strategies may be positioned on a scale from “strong intervention” to “laissez-faire“. Finally, we made a distinction between *mediation* focused on regional innovation systems, technological innovation systems and clusters respectively. The framework was successfully applied on 16 Swedish incubators, resulting in six model categories.

The framework presented in this paper, thus, provides a tool to describe the incubation models of different incubators. In combination with suitable outcome indicators, it can be used to identify best practise models or to distinguish between different models that are equally effective in achieving certain goals. Both these results would help policy makers to decide which incubators to support and provide guidance for incubator managers in their strategic work. In addition, the latter result ought to be of interest to the ventures applying to different incubators since it is likely that certain kind of incubator models are more attractive than others depending on the preferences of the

entrepreneurs. For example, some entrepreneurs are averse to share ownership, whereas others see this as a major benefit of incubation.

6. Issues for further research

Opinions have been put forward that there is one best practice model that suits all types of incubators. For example, Hackett and Dilts (2004a) claim that the more incubators behave like venture capitalist firms and the more intense their business support is, the better incubator performance can be expected. The empirical illustration in this paper indicates that there is room for several different models. Our hypothesis is, instead, that the incubator model has to be designed to suit the goal and surrounding context of the incubator and that it has to be internally consistent. In order to verify this hypothesis, a number of questions need to be addressed through an empirical analysis in a larger sample:

- Are some models better than others in achieving certain goals?
- Do selection strategies differ depending on the surrounding context of the incubator? (Is it, for example, reasonable to use the same selection criteria in rural as in urban areas as the example of Teknikdalen suggests?)
- How does “alignment” of the model components influence performance? Are some combinations of selection strategies, business support approaches and types of mediation more common and/or more successful than others? Are there combinations that are not at all compatible? (For example, it seems unlikely that a picking-the-winners & idea selection approach would work well a laissez-faire approach to business support in which no managerial support is provided.)

In addition, the issue of efficiency in terms of the required resources needs to be investigated further: Do some models require fewer resources to achieve the same level of performance than other models?

7. References

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Appendix A

In 2004, VINNOVA (the Swedish Governmental Agency for Innovation Systems) announced the third period of its VINNKUBATOR programme, which was focused on leadership development in and exchange of experiences and learning between incubators. The vision of the programme was for Swedish incubators to become professional “worldclass forums” for the support of new ventures. 41 incubators answered the call, applying for a total amount of 282 MSEK (approximately 41 MUSD).

After an evaluation process, 16 incubators were supported with amounts ranging between 2.7 and 12 MSEK (the maximum amount per incubator), adding up to 137 MSEK in total. Of these, 6 incubators received 50% or less of the amount they applied for. According to the call for applications, the support decision was based on three types of criteria: (1) Professionalism, in particular in terms of methods and models for the different functions and tasks of the incubator, (2) Vision, goal and strategies for incubator development and (3) Economic criteria (especially the amount of co-financing available).

Tables and figures

Figure 1: Evaluation model

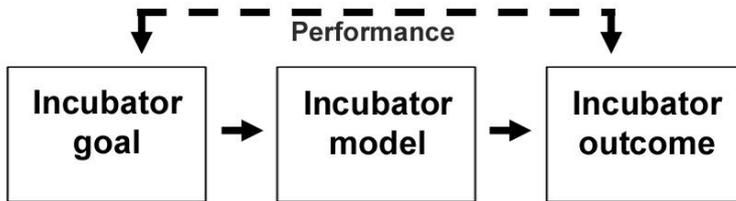


Figure 2: Incubator model components

Incubator model		
Selection	Business support	Mediation

Figure 3: Selection strategies

Selection strategies

	Survival of the fittest	Picking the winners
Idea-focused selection		
Entrepreneur-focused selection		

Table 1: Incubator model categories

Model categories	Selection	Business support	Mediation	Incubators
Category 1	Idea & picking-the-winners	Major involvement (shares and/or participation in management/board)	Technological innovation system	<i>Incubation at Chalmers, Karolinska Innovation Systems, GU Holding, (Teknikdalen^b)</i>
Category 2a	Idea/entrepreneur & picking-the-winners	Program-based, incubator-initiated	Regional innovation system	<i>Stockholm Business Incubator, Kista Innovation Growth, Science Park Jönköping</i>
Category 2b	Entrepreneur & picking-the-winners	Program-based, incubator-initiated	Regional innovation system	<i>Gothia Business Incubator, Uppsala Innovation Centre, Growlink Incubator</i>
Category 3	Entrepreneur & picking-the-winners	Loose/on demand, entrepreneur-initiated	Regional innovation system	<i>Aurorum Business Incubator, Ideon Innovation, Minc, (Teknikbyns Företagsgenerator^c)</i>
Category 4	Idea & picking-the-winners	Program-based	Cluster	<i>Inova, Umeå Innovation</i>
Category 5 ^a	Idea & survival-of-the-fittest	Loose, entrepreneur-initiated	Local	<i>As described above, many incubators (and universities) provide a pre-incubation process.</i>

^aThis applies primarily to idea hatchers.

^bTeknikdalen fits this category with regards to selection criteria and business support strategy. However, it has a regional mediation focus and is located in a region where the main sources of research ideas are a university college and two government agencies.

^cTeknikbyns Företagsgenerator has a similar approach to business support and mediation, but has a survival-of-the-fittest approach to selection (the only representative of this in our sample).

Vitae

Dr. Anna Bergek holds a M.Sc. in Industrial Engineering and Management and a doctoral degree in Technology Management, both from Chalmers University of Technology in Sweden. Since 2002, she is an assistant professor at the Department of Management and Economics at Linköping University in Sweden. Her main research interests include industry and innovation system dynamics and their relationship to public policy and firm strategy. She has published papers in international journals, including *Research Policy* and *Industrial and Corporate Change*.

Ph.D. candidate Charlotte Norrman holds a B.Sc. degree in Political Science and Social Geography from Linköping University in Sweden. She has worked for several years in organisations serving trade and industry, whereof most recently as a member of the founding team of one of the largest technology parks in Sweden. In 2003 she joined the IMIE doctoral programme at the Department of Management and Economics and she defended her licentiate thesis in December 2005. Her research interests include public support to early stage ventures. She has presented papers at the Babson-Kauffman Entrepreneurship Research Conference and the High-Technology Small Firms Conference.