

8. PAPER THREE: SORTING OUT THE APPLES, PEARS AND FRUIT SALADS IN INCUBATOR PERFORMANCE EVALUATION

ABSTRACT

Incubators are becoming a ubiquitous phenomenon in many parts of the world since they are regarded as solutions to increase the birth rates of technology-based enterprises. Considering the large amounts of money invested in incubators, the identification of best practices is of importance. This requires performance comparisons between incubators using different incubator models. The aim of the paper is twofold: (1) to sort out the key concepts and identify some of the problems inherent in the evaluation and comparison of incubator performance and leading to “apple-and-pear” comparisons and (2) to develop a framework that can serve as a basis for identifying best practice incubator models. We argue that it is necessary to take goal differences between incubators into account if performance instead of outcome is to be measured. Further, we identify the need to distinguish different incubator model from each other. We put forward a framework in which differences with regard to three key incubator model components are emphasised: selection strategies, business support strategies and mediation. Future research includes the empirical testing of this framework. If it proves to be generally useful, it will be applied in best practice studies.

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; Lindholm-Dahlstrand and Klofsten, 2002; Lyons and Li, 2003; VINNOVA, 2004). Such incubators are becoming 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 the emergence of new technology-based growth firms, economic development and innovativeness. 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. An important research issue has, therefore, been to describe the ‘value-added’ of incubators in comparison to other business environments, i.e. their unique contribution to new venture development, survival and growth and entrepreneurship (Chan and Lau, 2005; Phan et al., 2005):

“A recent global increase in the level of activity of these institutions has stimulated an important academic debate concerning whether such property-based initiatives enhance the performance of corporations, universities, and economic regions ... and has led to an interest among policymakers and industry leaders in identifying best practises.” (Phan et al., 2005, p. 2)

Consequently, 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, 1997; Nolan, 2003; OECD, 1997; Pena, 2004; Phan et al., 2005). There does not seem to be much consensus with regards to the definition of ‘performance’ and how it should be evaluated and compared, however. This might be one explanation why some studies have suggested that business incubation is an effective business development tool (Bollingtoft and Ulhoi, 2005) whereas other studies have found few significant differences between incubatees and off-incubatees (cf. Pena, 2004).

There are large variations between incubators, both in terms of output (traditionally measured as number of new firms, jobs, firm survival, investments etc.) and in terms of how they select and support their incubatees. It seems unlikely that all ‘incubator models’, i.e. different ways to organise and manage incubators, have the same potential to perform well. Comparing incubatees with off-incubator ventures is, therefore, not enough if we are to help policy makers to make resource allocation decisions, ventures to choose which incubators to apply to, and incubator managers to design selection criteria and support systems. In order to be able to identify best practices, we need to identify and compare the performance of incubators using different models.

The lack of a theoretical base for incubator performance evaluation was recognised almost ten years ago (cf. Mian, 1997), but only little effort seems to have been made to deal with this problem in recent years. *The aim of this paper is, therefore, to sort out a number of problems inherent in the evaluation and comparison of incubator performance and to develop a framework that can serve as a basis for identifying best practice incubator models.* We argue that there is an immediate risk of comparing apples with pears – or, rather, different types of fruit salads – making it extremely difficult and deceptive to draw any conclusions concerning best practices. Based on entrepreneurship and innovation systems research as well as on personal experiences of business incubation, we first illustrate the importance of distinguishing between different types of incubators before making performance evaluations and comparisons, and then illustrate how such distinctions can be made.

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 largely similar definitions have been put forward.⁴⁸ Four components have received particular attention in previous research:⁴⁹

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.⁵⁰

The relative importance of 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: "... 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). One source of confusion could be the lack of clarity with regards to whether an incubator is an organisation or a more general entrepreneurial environment. For example, in a often cited article by Autio and Klofsten (1998), the business network SMIL is compared to the business incubator Spinno. We have therefore chosen to reserve the concept of incubator for *organisations* dedicated to the support of emerging ventures.

⁴⁸ For a very detailed overview of present definitions, see Hackett and Dilts (2004b)

⁴⁹ One or more of these are mentioned in the following studies: 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; 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), VINNOVA (2004) and von Zedwitz (2003).

⁵⁰ To these basic components, Aernoudt (2004), Brooks (1986) and von Zedwitz (2003) add access to or assistance in acquiring seed and/or venture capital.

Another possible source of confusion is the lack of specification with regard to what part of the venture development process is considered. Bhabra-Remedios and Cornelius (2003) identify the possibility to differentiate between different types of incubators based on the development stage of the firms on which they are focusing: start-ups, business development or maturity. 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). In order to qualify the concept of early phase, we follow the work of Klofsten (1992; 2005), who separates between two stages in the development of new ventures (see Figure 1): pre-commercialisation and commercialisation. In the first stage, the aim is to reach a “launching platform”, where the idea is concrete enough to be communicated to others and there is agreement on its marketability. If successful, the idea enters the commercialisation stage, where the next step is to reach a “business platform” (Klofsten, 2005), where the firms has secured an input of resources and developed an ability to manage and utilise these resources.⁵¹

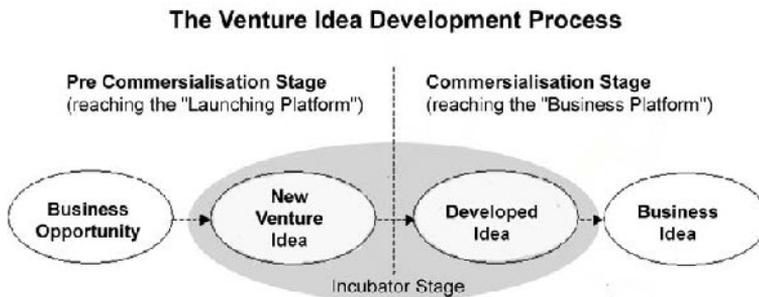


Figure 1: The venture development process. (Adapted from Klofsten (2005))

As is indicated by the shaded part in Figure 1, most incubators are concerned with ventures whose ideas are approaching the launching platform, but have not yet reached a fully established business platform. 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 developed idea, or in his wording: “the attempt stage”.⁵² 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 much more mature ventures.

⁵¹ For a more detailed discussion of the ‘business platform’ concept, see Davidsson and Klofsten (2003).

⁵² With regards to the lower limit to the scope of incubators, incubators may be less likely to concentrate on the first-day entrepreneur than, e.g., business angels (von Zedwitz, 2003).

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.

TODAY'S "MODEL" OF INCUBATOR PERFORMANCE EVALUATION

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). 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; see also Lindelöf and Löfsten, 2004), which according to some researchers is due to difficulties with regards to defining the "nature of performance" (Nolan, 2003; Phan et al., 2005).

However, putting together all the fragmented efforts within the incubator performance evaluation field, an implicit model emerges (see Figure 2). The two parts of the model – incubator goals and incubator performance – are discussed to a greater or lesser extent by most researchers.

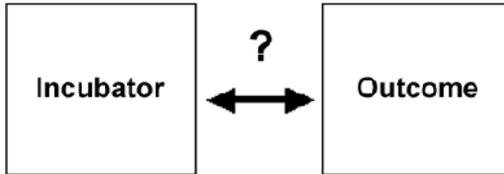


Figure 2: Today's implicit model of incubator performance evaluation

Above, incubators were described as organisations providing support to new ventures. *Incubator goals* refer to what incubator stakeholders expect the incubators to achieve by providing such support. *Incubator performance* refers to the extent to which incubator outcomes correspond to goals. We thus, make a difference between outcome and performance, where the latter is a relative measure taking expected outcomes (i.e. goals) into account.

Many previous studies have been concerned with identifying criteria and indicators to evaluate incubator performance. 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 performance evaluation 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’ performance outcomes.⁵³ However, in most studies such criteria have been used without regard to the goals of the studied incubators. In our wording, they, thus, measure *outcome* rather than performance. This is problematic since comparisons based on such measures are valid only to the extent that the studied incubators are homogenous with regards to goals.

However, such homogeneity is rare. Some incubators aim at accelerating the development of new firms, others at commercialising research from universities and institutes. Some incubators are set up by real estate owners with over-capacity, while others are set up by local authorities in order to give new life to tired regions. The list can be made long. That incubators differ in terms of goals is often recognised by incubator researchers. For example, they have earlier concluded 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) and that “goals vary from one organisation to another” (Bhabra-Remedios and Cornelius, 2003, p. 11). They have also recognised that different incubators have “unique origins and characteristics including goals” [Mian, 1997 #8, p. 263], or at least make “different priorities” within the same basic goals (Bollingtoft and Ulhoi, 2005).

It is, thus, surprising that when it comes to evaluating incubator performance all incubators are usually examined as if they have the same outcome objectives (Bearse, 1998; Sherman, 1999). As an illustration, Aernoudt (2004) makes clear distinctions between different kinds of business incubators and points out the deficiencies of mixing them up, yet without taking this into further consideration in her results.

The problem is of course that different goals correspond to different outcome indicators. If the goal is to create jobs, growth in sales is probably not the best indicator since it is not necessarily coupled to number of employees. On the other hand, it might be an excellent indicator for an incubator striving to commercialise research ideas. To compare incubators with different goals using the same indicator is, hence, like comparing apples with pears.

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

⁵³ In addition, some researchers list more general types of ‘incubator characteristics’ without clearly stating whether these characteristics influence performance or not (cf., e.g., Grimaldi and Grandi, 2005).

interests (OECD, 1997). This implies that we are not only in the danger of comparing apples to pears – in the worst case, we can make ourselves guilty of comparing different types of fruit salads.

It may, however, 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, people 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. Since we are primarily concerned with evaluations and comparisons that aim at identifying best practices, we however argue that measures of outcomes are of limited value by themselves. If we fail to control for goal differences, we have no way of explaining differences in outcomes, to find out if they are, in fact, the result of differences in practices or merely of differences in focus.

As recognised by Mian (1997) “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). This implies that, in order to identify best practices, we not only need to control for goal differences, but also have to be able to distinguish between different incubator models, i.e. *how* or *in what way* incubators support new ventures. The aim is to compare the performance of different models, i.e. their outcomes in relation to some predefined goal. However, although several researchers have discussed the importance of incubator management and identified the need for finding best practices (cf. Autio and Klofsten, 1998; Colombo and Delmastro, 2002; Hannon, 2003; Mian, 1997), to our knowledge no one has explicitly dealt with the issues of how incubator support is currently provided and how incubators differ in this respect.

To sum up, in most incubator performance evaluations, incubators are regarded as more or less generic with regards both to *what* they strive to achieve and *how* they organise themselves in order to achieve it. It, thus, implies an immediate risk of comparing incompatible entities and does not support the identification of best practice incubator models. Our conclusion is that when best practice identification is the issue, we need a way to distinguish between incubators with different goals and models if we are to avoid making “apple and pear” comparisons.

DISTINGUISHING BETWEEN DIFFERENT INCUBATORS

To categorise incubators is not an obvious task (OECD, 1997), and a number of previous efforts have been made (see the comprehensive review by Hackett and Dilts (2004b)). Most of these have got their merits, but when it comes to evaluation, comparison and best practice identification, they are useful only if goals and incubator models are homogeneous within each category. According to our experience, this is seldom the case. In the following, we will therefore suggest some bases for making

distinctions based primarily on incubator model features, but also taking differences in goals into account. Our framework is summarised in Figure 3.

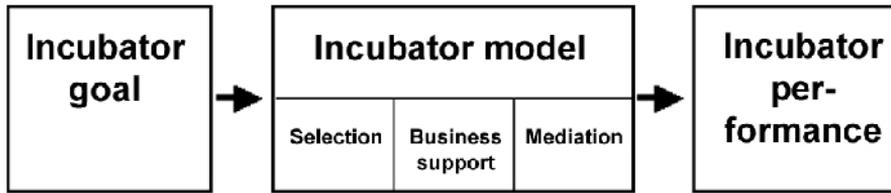


Figure 3, The proposed framework for incubator performance evaluation

DECODING INCUBATOR GOALS

Some of the categorisations mentioned above take their departure in the overall purpose of the incubators. Two main principles have been used. The first is based on ownership and governance and makes a distinction between for-profit⁵⁴ and non-for-profit incubators (see, e.g., Bollingtoft and Ulhoi, 2005; Lyons and Li, 2003; Peters et al., 2004). The second is based on the overall focus of the incubator in terms of how it expects to influence its larger environment. A common distinction is that between (a) incubators that aim at 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) incubators that aim at 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). Several other attempts have also been made with features of both these categorisation principles (see, e.g., Aernoudt, 2004; Grimaldi and Grandi, 2005; von Zedwitz, 2003).

With only a few exceptions (Bearse, 1998; Brooks, 1986), these categorisations do not seem take into account that goals may differ within these categories and that incubators may have mixed goals. Constructing a multitude of categories in order to cover all possibilities cannot be recommended, though. Instead, we suggest researchers to follow the advice of Bearse (1998) and let classifications fall out of the data. This implies that categories defined for other purposes or evaluations should be avoided (Bearse, 1998). Comparisons should then, preferably, only be made between incubators that fall into the same class, but at the very least evaluators should weight outcome indicators differently for different classes (Bearse, 1998).

Decoding the goals of an incubator requires the researcher to identify incubator owners, board members, financiers etc. and ferret out their agendas. This is, of course,

⁵⁴ Here we also include real-estate incubators.

not an easy task to undertake, especially since the ‘explicit’ goals stated by incubator managers in, for example, official documents, interviews and applications for funding usually only reflect part of the picture. There are plenty of examples of incubators trying to portray themselves from the best possible angle with regards to whatever they believe that the recipient will value. For example, in a study by Mian (1997), all four incubators stated that their goal was to “seek participation in the state’s economic development activities”. Is this statement likely to reflect the true goal(s) of these incubators?

If it is impossible to identify incubator goals, we suggest that researchers instead could consider the incubators’ portfolios of incubatees and compare incubators with similar portfolios. Even if such comparisons do not allow the identification of best practices in relation to a particular goal, it at least gives some indications on how best to support a particular type of venture portfolio. If incubators do not even have portfolios with similar characteristics, the conclusion must be that comparisons are fruitless since “a comparative evaluation approach is justifiable only when programs are truly comparable” (Mian, 1997, p. 261).

DEVELOPING THE ‘INCUBATOR MODEL’ CONCEPT

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 the main components of such models:⁵⁵ *Selection* refers to decisions concerning which ventures to accept for entry and which to reject. *Infrastructure* consists of ‘administrative’ services. *Business support* is associated with coaching/training activities. *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 Ulhøj, 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. We, therefore, suggest that selection, business support and mediation are the main distinguishing components of incubator models.

⁵⁵ See e.g. Soetanto (2004), Hackett and Dilts (2004b) and Peters et al. (2004).

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(s). 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 knowledge of more general business development requirements in relation to which the experience, skills and characteristics 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 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 etc. to provide the selection processes that over time will separate winners from losers.⁵⁶

If we combine these two types of approaches of the selection component, we get four “selection strategies” (see figure 4), which are likely to result in very different

⁵⁶ These approaches have some common features with Clarysse et al.’s (2005) different “models of spinout activities”.

incubator “portfolios” of incubatees. With a “survival-of-the-fittest idea” strategy, the incubator portfolio will presumably consist of a quite large number of ventures related to one or a few technological fields. With a “survival-of-the-fittest-entrepreneur” strategy, the incubator portfolio will be much more diversified, with ventures representing many different knowledge areas. A “picking-the-winning-ideas” strategy is likely to result in a highly niched portfolio of a few firms within a quite narrow technological area. Finally, a “picking-the-winning-entrepreneur” strategy, incubatee ventures will be lead by a few handpicked entrepreneurs on which incubator managers have high hopes.

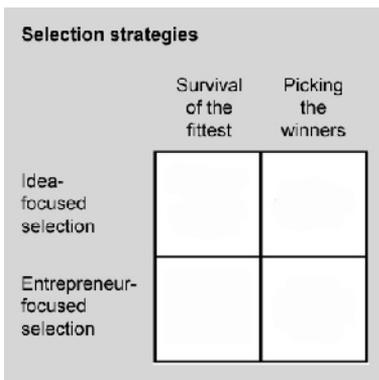


Figure 4, Selection strategies

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 advice and services concerning general business matters such as accounting, legal matters and advertising, financial assistance, entrepreneurial training and business development services (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 and marketing.

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, which may be referred to as “counselling by walking around”
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 with respect to whom the initiator is (the entrepreneur or the incubator staff) and to 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 baby-sitting, ventures are guided through the incubation process by the steady hand of the incubator staff and its advisors. 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.

MEDIATION

In order to explain the concept of ‘mediation’, we take our departure in the innovation system approach. This part of the literature on innovation emphasises that innovation processes are not primarily the concern of individual actors, but instead involve a variety of feedback loops between activities and take place within broader *innovation systems* consisting of actors, networks and institutions (Breschi and Malerba, 1997; Carlsson and Stankiewicz, 1995; Edquist, 1997; Freeman, 1995; Jacobsson and Johnson, 2000; Lundvall, 1992; Nelson, 1992). These may be found on different system levels – technology, sector, region and/or nation – and may be prominent features of the selection environment (Johnson and Jacobsson, 2001).

As the incubation process, consequently, transcends the incubator (Hackett and Dilts, 2004a), one important incubator role is 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).⁵⁷

Two dimensions of this role have been described in earlier literature. First, 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).⁵⁸ Such 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).

Second, incubators may 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.⁵⁹ 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 (Bollingtoft and Ulhoi, 2005; Collinson and Gregson, 2003; Smilor, 1987; see also Suchman, 1995; and 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 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

⁵⁷ 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).

⁵⁸ We have chosen the concept of 'network mediation' instead of the more commonly used 'networking' in order 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. The latter may, however, be an important basis for the former; incubators usually use their 'incubator network' in their mediation role.

⁵⁹ For a comprehensive overview of different types of institutions, see Scott (1995).

whether the technological or the regional dimension is the more important, we recommend that clusters be treated as a third category.⁶⁰

SUMMARY AND CONCLUSIONS

The aim of this paper was to sort out some of the problems leading to “apple-and-pear” comparisons in incubator performance evaluation and comparison and to develop a framework that can serve as a basis for identifying best practice incubator models.

In summary, most researchers seem to follow an implicit “model” for incubator performance evaluation that has two main deficiencies. First, most studies fail to take incubator goals into consideration and, thus, measure outcome rather than performance. 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 are usually neglected. These deficiencies imply an immediate risk of comparing incompatible entities, i.e. apples, pears or different types of fruit salads, making it extremely difficult and deceptive to draw any conclusions concerning best practices.

In order to avoid these problems, we recommend researchers who aim at identifying best practices to take into account that incubators are different by letting classes of incubators “fall out” of the data and evaluating each class using different performance criteria. In addition, incubators need to be categorised with respect to the models they use if best practises are to be identified. We, therefore, suggest that different incubators may be distinguished from each other by using three key incubator model components – selection strategies, business support strategies and mediation.

With respect to selection, we put forward a four-field categorisation matrix consisting of the following strategies: picking-the-winning-idea, picking-the-winning-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 a “laissez-faire” strategy to a “baby-sitting” strategy. Finally, we make a distinction between *mediation* focused on regional innovation systems, technological innovation systems and clusters respectively.

It should be noted that the distinctions suggested above are yet to be confirmed empirically. As the next step, we will therefore analyse applications for government funding from a population of approximately 40 incubators, which contain detailed information on stakeholders, goals and models. This information will be complemented by interviews with incubator managers and incubatees. However, we

⁶⁰ According to some researchers, incubators have a close connection with clusters and may even serve as catalysts or accelerators of cluster formation (Carayannis and von Zedwitz, 2005). Others have found that being located in a strong cluster may improve incubator performance (Hsu et al., 2003).

have already received comments from a number of incubator managers, who feel comfortable with the proposed categorisations and find them useful as a tool to communicate their chosen strategies and models.

If the framework proves to be generally useful, we will apply it in studies of the relationship between incubator model and performance. 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. In contrast, our hypothesis is that there is room for several different models, suiting different contexts, and that the important thing is the alignment between incubator model and incubator goals as well as within the model (between selection, business support and mediation strategies). If this hypothesis is confirmed, the framework may also be used as a diagnostic instrument to evaluate alignment within incubators.

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