

# Measuring business incubation outcomes

## An Irish case study

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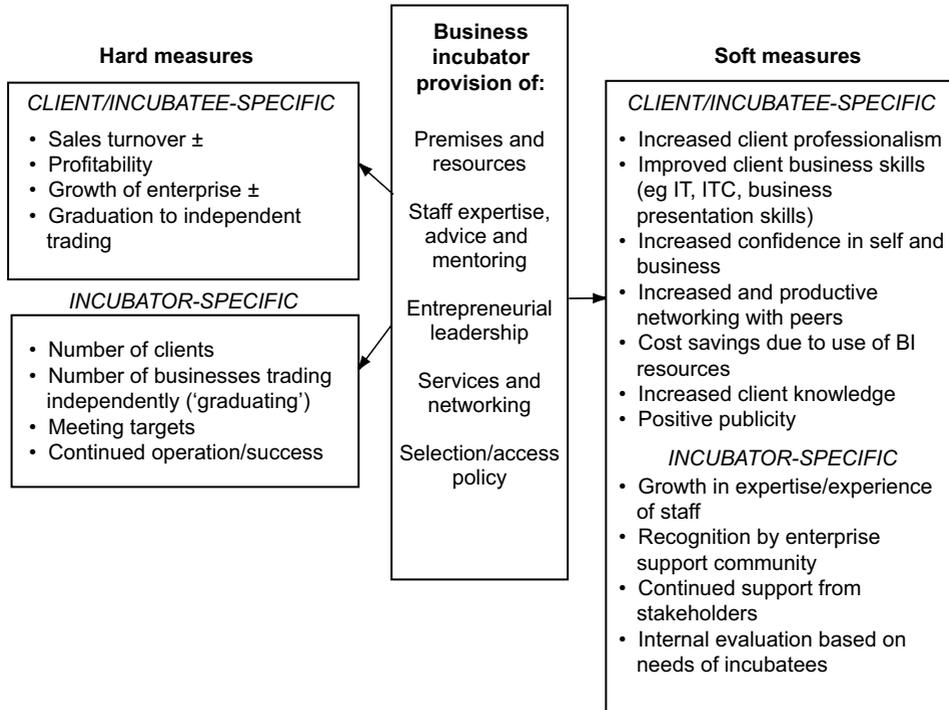
**Abstract:** *This paper examines the impact of business incubation on its participants (incubatees). The research presented enhances the conceptual framework of performance measures for business incubation proposed by Voisey et al (2006). Following an extensive review of the literature, data were collected using a survey of 43 incubatees and interviews with a random sample of 12 of them. The survey questionnaire examined data in two categories: hard and soft measures – the former relating to sales turnover, profitability, growth, independence and the number of clients, and the latter to professionalism, improved business skills, confidence, productivity, knowledge, cost savings and publicity. The interviews explored the incubatees' experience of life in a business incubation centre and of networking with other incubatees. The findings indicate that the measurement of business incubation outcomes needs to be broader than a set of statistical outputs. A modified version of the framework proposed by Voisey et al provides an appropriate holistic approach to evaluating business incubation outcomes. The framework proposed includes hard and soft measures and the measurement of outcomes at three stages: pre-incubation, during incubation and post-incubation. This study offers an example of a measurement approach that captures the value of business incubation, and thus should be useful to incubators, sponsors, incubatees and academics.*

**Keywords:** *business incubation; hard and soft measures; entrepreneurs; Ireland*

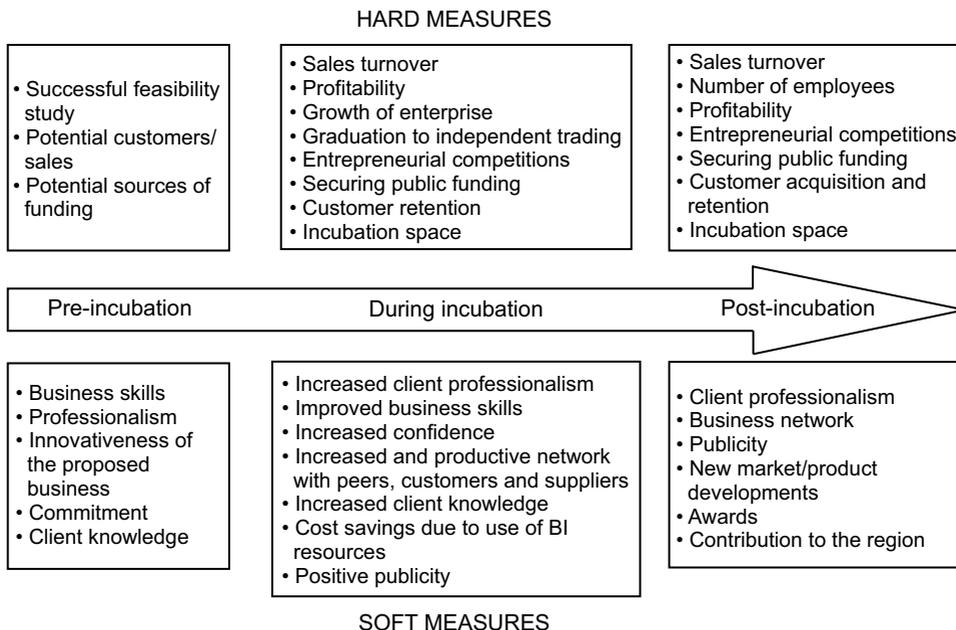
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The importance of incubation as a means of developing successful start-up and spin-off businesses is well documented in the academic literature (Hackett and Dilts, 2004b; Maital *et al*, 2008; Khalid *et al*, 2011). Ryan and Wright (2009) explain that in Ireland business incubation programmes have emerged to enhance the important roles played by small and medium-sized enterprises (SMEs) in the economy and to minimize the

failure rate of start-up enterprises. Erikson and Gjellan (2003) report that there have not been many objective studies on business incubators as most of them have been generated by incubator managers. In addition, the perceptions of the sponsors of incubator centres (Mian, 1997) and the expectations of venture capitalists (Black *et al*, 2010) have been studied. However, Voisey *et al* (2006) point out that the experience of the incubatee is



**Figure 1.** A conceptual framework identifying the performance measures of business practice in incubators. Source: Voisey et al (2006, p 465).



**Figure 2.** A conceptual framework of hard and soft measures for evaluation before, during and after the incubation process.

rarely sought. Therefore, this paper presents a case study of the impact of the business incubation process on the incubatee. Specifically, this paper aims to address three research questions: what are the *hard* outcomes of business incubation for incubatees? What are the *soft* outcomes of business incubation for incubatees? How do the *hard* and *soft* outcomes change, pre-incubation, during incubation and post-incubation? The conceptual framework of performance measures for business incubation proposed by Voisey *et al* (2006, p 465) was used to investigate the effectiveness of business incubation practices. Figure 1 illustrates the framework proposed by Voisey *et al* (2006), which identifies *hard* and *soft* measures for both the incubatee and the incubator (see Figure 1).

The framework does not consider the incubation phase. Therefore, data were collected from incubatees who were at three distinct stages in the business incubation process: pre-incubation, during incubation and post-incubation. The result is a data set in two parts (*hard and soft measures*) and at three stages. In addition, the measures that the incubatees used to evaluate their incubation experience were collected. The outcome is a conceptual framework for evaluating business incubation outcomes (see Figure 2) delivering enhancements to the measurement and evaluation of the incubation process.

## The incubation process

SMEs are central to enhancing national economic growth and employment, and numerous Irish government programmes contain policy instruments addressing SMEs (DETE, 2008; Enterprise Ireland, 2010). Structures and strategies including business incubation initiatives are being introduced to help small enterprises and to develop entrepreneurial skills. Finer and Holberton (2002, p 23) explain that in the 1990s business incubation became the answer to entrepreneurs' and investors' most fervent prayers. Business incubators are useful facilities where fledgling enterprises can survive and grow in a supportive environment. Hannon (2005, p 73) suggests that the individual needs of each user (incubatee) will vary depending upon many factors, including context, personal and organizational aspirations, previous experience and the local business environment. Business incubators are set up by local authorities or universities with the aim of stimulating employment and commercializing research. Thompson and Downing (2007) and Cameron (2007) propose that business incubation should offer a supportive and nurturing environment for new and young businesses. The literature (Finer and Holberton, 2002; Hackett and Dilts, 2004b; Thompson and Downing, 2007) indicates

that there are three types of incubation process. First, there is an incubation process that involves the diagnosis and treatment of business problems, with the aim of lowering the early-stage failure rate. Second, there is an incubation process aimed at creating new businesses through the development of new entrepreneurs. Typically, these entrepreneurs want to develop/commercialize their talent and ideas. Third, there is the incubation process which involves spin-offs. In this case, the incubatee may have left a company either permanently or on sabbatical with the aim of developing a product or service which is complementary or supplementary to the product or service being provided by his or her original employers. In these cases, the business incubation process will focus on utilizing specialized personnel to develop a prototype and to test the new product and/or service.

Business incubation policy and practice are primarily focused on developing a supportive environment by providing access to opportunities, resources and support services. Unfortunately, only a minority of businesses make it from the start-up phase to maturity. Poor management practices and a lack of capital are frequent reasons for the failure of business start-ups. Allen and Rahman (1985, p 13) explain that small firms are often created to exploit a market segment not catered for by other firms. Entrepreneurs may have considerable knowledge about market niches because of their previous experience in larger enterprises involved in related products, technologies or markets. Of course, some entrepreneurs lack the business acumen to develop and maintain a successful company. This is why policy makers provide business incubation for entrepreneurs. However, Hackett and Dilts (2004b, p 42) caution that business incubators are not the all-powerful innovation hatcheries that the media made them out to be during the stock market bubble of the late 1990s.

The expectation is that the business incubator will facilitate knowledge and training in addition to providing low-cost accommodation and professional services. Atherton and Hannon (2006) reflect that as a broad approach to enterprise development, business incubators can generally be considered a positive and effective means of intervention. Evidence from Nahavandi and Chesteen (1988) indicates that enterprises based in a business incubation centre (BIC) generally report a greater level of satisfaction and a higher turnover than entrepreneurs not in receipt of assistance. Hackett and Dilts (2004b, p 61) propose that when studying the incubation process it is important to keep in mind the totality of the incubator. Specifically, the incubator is not simply a shared space; rather, the incubator is also a network of individuals and organizations including the incubator, the sponsor, the incubatee, a higher education

institution (HEI), industry contacts and a range of professional services. Therefore, the measurement of business incubation outcomes must capture the complexity of the process and the impact of different elements of the network on the incubatee. Merrifield (1987) describes the incubation process in terms of the services provided, explaining that, typically incubators provide: secure, affordable, flexible, well equipped physical space; readily accessible support services; professional, business, management and technical consulting; access to seed and working capital, grants, loan financing, venture capital and research, development and innovation (RD&I) partnership funding; access to an HEI with expertise in a range of disciplines; and an interactive community of entrepreneurs, academic and business interests that stimulate and encourage entrepreneurs. The ways in which these services affect the professional and personal development of the entrepreneur must be measured and used to inform the design of business incubation.

## Business Incubation Centres in Ireland

In Ireland, government support for business incubation is led by the Department of Jobs, Enterprise and Innovation; and Enterprise Ireland. One initiative is the development of Business Incubation Centres (BICs) on campus at HEIs. In delivering business development initiatives, the BICs support knowledge and technology transfer, along with the commercialization of research. The operation of the BICs is supported by publicly sponsored incubation programmes, venture capitalist and private finance companies. We have chosen the BIC initiative for this study because the centres provide examples of the three incubation processes: diagnosis and treatment of business problems; new enterprise development; and spin-offs (Finer and Holberton, 2002; Hackett and Dilts, 2004b; Thompson and Downing, 2007). The BICs provide an environment for companies to access mentoring on key aspects of business development, including market research, finance and commercialization. Furthermore, the incubatees have access, as appropriate, to the research and technological expertise and the RD&I facilities of the centre and the associated HEI. The BIC initiative in Ireland provides two additional types of support: first, the national technology transfer system which enables the transfer of commercially valuable research outputs into industry; and second, the provision of commercialization specialists who work with an entrepreneur and an HEI-based research team to nurture and develop a high-potential start-up. The impact is significant, especially in the current challenging business environment. Incubatees are freed from the shackles of limited credit and prohibi-

tory start-up costs. The overall aim is to grow the entrepreneur (and his or her company) so that he or she can export and access a supportive environment in which to develop an enterprise and foster links with researchers, technology partners and other incubatees.

## Measuring incubation outcomes

Hackett and Dilts (2004b, p 73) explain that the *attempt* to measure the impact of business incubation is as important as it is challenging. Hackett and Dilts (2004b) also suggest that there is a lack of peer-reviewed studies on the impact(s) of business incubation. Hamdani (2006, p 19) explains that early studies evaluated the business incubation process based on a range of taxonomies: origin, business focus, sponsorship, admission criteria, networking and market failure (these taxonomies did not reveal any significant differences). Furthermore, a review of published research undertaken by Hannon (2005) identifies that there has been an emphasis on the nature of business incubators and incubation, what they do and how they do it, rather than any attempt to inform the debate critically concerning the effect of such initiatives on the incubatees. Therefore, this study evaluates the experience of the incubatees. Voisey *et al* (2006) propose that business incubators create other outputs in addition to profit and cost improvements (*hard* measures), which they classify as *soft* measures. *Soft* measures are benefits such as increased business knowledge and skills, business awareness and client networking. These are subjective measures which are difficult to ascertain and assess, but nonetheless exist. Ramsden and Bennett (2005) measured the benefits of external support to SMEs using two types of criteria: objective and subjective. They concluded that SMEs valued advice primarily for its *soft* benefits. Bennett (2007) evaluated the advice given to SMEs using a range of criteria from *hard* objective impacts to *soft* personal development impacts. These two studies confirm that there is merit in asking incubatees to use both *hard* and *soft* measures to assess the impact of business incubation.

## Methodology

This research employs an individual case study methodology which evaluates the *hard* and *soft* outcomes of the BIC initiative in Ireland for incubatees. Eisenhardt (1989) and Yin (1994) report that the case study method has been widely used as a research instrument for data collection, theory building and policy/programme development. The case study method has been used in a business setting to improve practice, typically by aiding the development of best practice principles and/or

conceptual frameworks for measuring outcomes (Lewis, 2001; Carrier *et al.*, 2004; Ozelkan *et al.*, 2007; Stephens and Onofrei, 2009). In this research, and following a review of the literature, a case study design was used to explore the outcome(s) of the BIC initiative. When deciding on the number of case studies, a balance must be struck between the depth and the breadth of study. There is no overall consensus on the ideal number of case study companies. In this study we chose a single BIC, and the unit of analysis was the incubatee. A single BIC was chosen because each of the 24 BICs is supported by Enterprise Ireland and is designed, structured and managed in a similar manner. We have excluded the six Bio-Incubation centres, which are not comparable. A list of incubatees who had used our chosen case study BIC was secured and we then approached the 51 incubatees to participate in this study. Forty-three of them agreed. The group included incubatees involved in the three incubation processes: diagnosis and treatment of business problems; new enterprise development; and spin-offs. The participants were at one of the three phases of the incubation process: pre-incubation, during incubation and post-incubation.

Each incubatee completed a questionnaire and 12 of them were randomly selected for interview. For each incubatee, data were collected under the following themes: data characterizing the participants; the history of the incubatee, especially reconstructing the process of evolution; performance measures (*hard* and *soft*); and enablers and disablers facilitating progress. A mix of Likert scales, rank-order rating scales and open-ended questions were used. For the assessment of impacts, respondents were asked to assess their experience in the BIC using a five-point Likert scale. Robson (2002) explains that the most common Likert scale is that which has five fixed-alternative expressions. Furthermore, Bennett (2007) used a five-point scale to study the impacts of advice on SMEs. Tight (2003, p 188) explains that it is difficult to imagine anyone undertaking a meaningful piece of research which does not involve some documentary analysis. Therefore, it was essential that sufficient access to company documentation was secured and a review undertaken.

The interviews explored the incubatees' experience of *life* in the BIC and their experience of networking with other incubatees. In the context of business incubation, qualitative data on *soft* outcomes can be used to measure and demonstrate success in a number of ways: to highlight progress at an individual level; to show stakeholders what progress is being made; and to assess support for the project. Consideration of *soft* outcomes provides a valuable context for clients' needs and progress, rendering a truer, more rounded picture of successes (Dewson *et al.*, 2000). Narrative structuring

(Kvale, 1996) was used to create a coherent story based on the incubatees' responses. Finally, cross-case conclusions were written. The findings are presented in the next section. The conceptual framework (Figure 2) and four recommendations are presented in the penultimate section.

## Findings and discussion

The 43 incubatees represent the following sectors: healthcare, ICT, engineering, the audiovisual sector, recycling, software development, educational software, agrifood and e-business. The respondents' educational attainments varied from early school leavers to undergraduate and postgraduate qualifications in a variety of subject areas. The respondents' work experience ranged from three to twenty-five years, typically in complementary industries. In line with the findings of Merrifield (1987), Mian (1997) and Finer and Holberton (2002), the participants listed a range of business incubation services that they utilized. These included: access to the Internet and telephone services; desk and office space; training and workshops; meeting rooms; and on-site consultants. Following the profile section of the questionnaire, respondents were asked a series of questions based on the conceptual framework of performance measures for business incubation proposed by Voisey *et al.* (2006). The aim was to measure the outcome(s) of the respondents' incubation experience. The results are presented in the next two sections.

### Hard benefits

The respondents were asked to identify what impact the incubation process had had on their business in terms of four *hard* benefits. The results are shown in Table 1.

Respondents identified the primary benefit of the incubation process as the growth of their enterprise (79%) and a reduced reliance on incubation support (51%). Thirty-five per cent of respondents indicated that sales turnover had improved and/or profitability had increased. In addition, the respondents were asked to rank these measures according to their relative importance to the business. Respondents ranked reduced reliance on incubation support as the least important *hard* benefit, followed by achieving growth of their enterprise. The highest rankings were attributed to increased sales turnover and profitability. These findings reveal a gap between the incubatees' expectations and their perceptions of the *hard* benefits gained during the incubation process. Therefore, there is a need to explain clearly the role of the incubation process to participants in order to avoid such *gaps* distorting evaluations. This issue is highlighted by Hackett and Dilts (2004b, p 73),

**Table 1. The hard benefits of incubation.**

Benefit	Responses	% of total sample	Rank
Achieved the growth of enterprise	34	79	3
Reduced reliance on incubation support	22	51	4
Sales turnover has improved	15	35	2
Profitability has increased	15	35	1

Note: n = 43 respondents.

**Table 2. The soft benefits of incubation.**

Benefit	Responses	% of total sample	Rank
Increased confidence in myself and my business	34	79	1
Increased and productive network with peers	34	79	6
Increased business knowledge	34	79	5
Achieved cost savings due to incubation resource	30	70	4
Increased professionalism	26	61	3
Increased range of business skills	26	61	2
Increased positive publicity	18	42	7

Note: n = 43 respondents.

who assert that the incubation process has to be viewed as a strategy for facilitating new business development rather than a strategy for developing real estate. Hence the incubation process has to be accepted as a long-term strategy for growing the enterprise, leading to increased sales turnover and profitability. The respondents noted three additional *hard* benefits that they used to evaluate the outcome(s) of their incubation experience. These additional benefits are: success in entrepreneurial competitions; securing public funding; and customer retention.

**Soft benefits**

The respondents were asked to identify what difference the incubation process had made to their business in terms of *soft* benefits. The results are presented in Table 2.

Respondents identified the important *soft* benefits of the incubation process as: confidence, networking and business knowledge (79%); professionalism and business skills (61%); and cost savings due to incubation resources (70%). Forty-two per cent of respondents reported that the incubation process had led to increased and positive publicity. In addition, respondents were asked to rank these measures. Confidence, business skills and professionalism were perceived as the most important *soft* benefits. Following the questionnaire, 12 interviews were conducted with a random sample of the incubatees. The interviews explored the incubatees’ experience of *life* in the BIC and their experience of networking with other incubatees. A number of the responses to the questions reflect an appreciation of the *soft* outcomes of the incubation process:

‘The nature of the centre meant I worked much harder and achieved a lot in a short space of time much more than I would have without the centre. Each week the training sessions spurred me on to implement what I learned in my business.’ (Respondent 4)

‘I have forged a closer relationship with the centre [BIC] since moving in – in fact I owe the centre for access to additional funding, free PR, etc. I try to assist in any way with promoting the centre through recommendations and providing information to prospective clients and guests.’ (Respondent 10)

Internal networking was highlighted by several respondents as an important *soft* benefit which contributed to their success/motivation. One respondent describes,

‘being in a room with other participants (incubatees) is helpful in that we have the opportunity to bounce ideas off each other and get instant feedback ... someone to chat to about challenges’. (Respondent 1)

And the next respondent identified both hard and soft benefits:

‘I was allowed to grow in a great environment, while saving funds which was vital to my start-up’. (Respondent 8)

Another incubatee describes how being associated with the BIC meant that they:

‘gained a lot of credibility through links with college and the centre, even just having the mailing address helped too when trying to contact people at the start’. (Respondent 8)

The respondents note that although it is difficult to quantify *soft* benefits, they augment the business development process. Therefore, there is a need to measure the *soft* benefits of business incubation.

## Conceptual framework of measures and recommendations

The responses indicate the need for a holistic approach to the measurement and evaluation of business incubation. This approach should utilize *hard* and *soft* measures. Furthermore, there is a need to conduct evaluation before, during and after the incubation process, and this is illustrated in the proposed framework presented in Figure 2. In addition to the hard measures proposed by Voisey *et al* (2006), four more *hard* measures were proposed by the incubatees: location/incubation space; success in entrepreneurial competitions; securing public funding; and customer retention. The incubatees proposed three additional *soft* measures: increased productivity due to incubation structures; networking (with other companies and customers across a range of locations); and a positive image associated with being on a recognized programme. These measures are merged with those presented by Voisey *et al* (2006) and are illustrated in Figure 2.

In line with Voisey *et al* (2006), we acknowledge that there is a wide range of impacts associated with business incubation programmes. In addition, we suggest that these impacts (and their measurement) change over the course of the incubation process. Figure 2 illustrates that the measurement of business incubation outcomes must take cognizance of the stage the incubatee is at in the incubation process. Therefore, we propose a set of three *hard* and five *soft* measures that can be used at the pre-incubation stage. This set expands to eight *hard* and seven *soft* for measurement during incubation. In the final post-incubation stage, the set of measures includes seven *hard* and six *soft* measures. These measures attempt to capture the overall impact of the process on the incubatee and his or her standing in the business community. Figure 2 reflects the diversity of impacts, and we propose that these measures should be recognized by funding and support agencies when assessing the impact of business incubation programmes/centres.

In addition to the proposed framework of measures, and based on evidence from this research combined with our experience of working with small firms, we make

four recommendations in relation to incubation. First, there is a need to prioritize networking among the incubatees and to ensure that they are facilitated in networking with other companies, suppliers and customers. Second, in addition to access to consultants, there is a need to make funding available for incubatees to source specialized expertise that may not be required by other incubatees (Enterprise Ireland runs a successful innovation voucher scheme). Third, progression should be linked to the incubation space in which the incubatee operates. That is, successful incubation often starts with a desk and progresses to a private working space. This would allow a new measure, *location/incubation space*, to be used for evaluation. Fourth, and finally, successful incubatees should be retained as mentors to new startups; and, linked to this recommendation, there is a need to provide post-incubation support and evaluation.

## Conclusion

Authors including Mintzberg and Gosling (2002) and Ghoshal (2005) have focused their arguments on the limited impact of research on practice in business management. Furthermore, Bensimon *et al* (2004) argue that there is a need to enhance the link between research and practice by studying problems that are of greater relevance to policy makers and practitioners. The findings of this research indicate that the measurement of business incubation outcomes needs to be broader than a set of statistical outputs. A modified version of the framework proposed by Voisey *et al* (2006) provides an appropriate holistic approach to evaluation. One limitation of this study is that all the participants were located in the same BIC. Therefore, further studies at other BICs would help to enhance our understanding of the outcomes of business incubation and capture the variety of incubation experiences. This study indicates that the personal development of the incubatee is an important feature of business incubation. For the entrepreneurs, improving their personal skills, confidence and professional networks has a positive impact on their commitment to the incubation process.

The entrepreneurial process is a progressive operation, and measures relating to phases before, during and after incubation are necessary to reflect the development of incubatees over time. This study offers a measurement approach that captures the value of incubation at three distinct stages, and thus should be useful to incubators, incubatees, sponsors and academics. The stakeholders in the business incubation process can use the framework to improve the measurement of the incubation process outcomes. Specifically, this will help improve the design of business incubation, creating: improved service quality from incubators; greater

personal and business success for incubatees; improved returns for sponsors; and case studies of greater relevance to academics. Business incubators are under continuous pressure to provide a definitive measure of their (successful) practice. However, success cannot be accurately measured using only *hard* measures. The addition of soft measures provides a comprehensive framework for the evaluation of business incubation outcomes. The use of the framework and the implementation of the four recommendations should secure what Hannon (2004) calls the *payback* from business incubation programmes resulting in either: increased outputs of better quality in reduced time to market; or healthier, stronger outputs less susceptible to debilitating processes.

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