



Knowledge transfer in a start-up craft brewery

Journal:	<i>Business Process Management Journal</i>
Manuscript ID	BPMJ-07-2017-0205.R1
Manuscript Type:	Original Article
Keywords:	Knowledge transfer in start-ups, SME start-ups, SME development, SME business processes, craft beer

SCHOLARONE™
Manuscripts

Knowledge transfer in a start-up craft brewery

Abstract

Purpose: This paper explores the role of the entrepreneur in the knowledge transfer (KT) process of a start-up enterprise and the ways that role should change during the development phase to ensure mid-term business survival and growth.

Design/methodology/approach: An in-depth, qualitative case study of Birra Flea, an Italian craft brewery, is presented and analysed using Liyanage et al.'s (2009) framework to identify the key components of the KT process, including relevant knowledge, key actors, transfer steps, and the criteria for assessing its effectiveness and success.

Findings: The entrepreneur played a fundamental and crucial role in the start-up process, acting as a selective and passionate broker for the KT process. As Birra Flea matures and moves into the development phase, the role of the entrepreneur as KT's champion needs to be integrated and distributed throughout the organisation, with the entrepreneur serving as a performance controller.

Research limitations/implications: This study enriches the knowledge management literature by applying a framework designed to provide a general description of KT, with some modifications, to a single case study to demonstrate its effectiveness in differentiating types of knowledge and outlining how KT can be configured to support essential business functions in an SME.

Practical implications: Our analysis systematises the KT mechanisms that govern the start-up phase of an award-winning SME, with suggestions for how to manage KT during the development phase. Seldom are practitioners given insight into the mechanics of a successful SME start-up; this analysis serves as a practical guide for those wishing to implement effective KT strategies to emulate Birra Flea's success.

Originality/value: The world's economy thrives on SMEs, yet many fail as start-ups before they even have a chance to reach the development phase, presenting a motivation to study the early stages of SMEs. This study addresses that gap with an in-depth theoretical analysis of successful, effective KT processes in an SME, along with practical implications to enhance the knowledge, experience, and skills of the actors that sustain these vital economic enterprises.

Keywords: Knowledge transfer in start-ups; SME start-ups; SME development; SME business processes; craft beer

Introduction

Through a case study of Birra Flea, an Italian craft brewery founded by entrepreneur Matteo Minelli, we explore the changing role of entrepreneurs in the knowledge transfer (KT) process during the start-up and development phases of an SME. Birra Flea is an interesting business that is constantly growing. Due to an advantageous connection between one of the authors and Minelli, Minelli's role is analysed with a particular focus on his ability to engage other people in the process of establishing the brewery.

KT is recognised a process that is laborious, time-consuming, and difficult, and is often thought of as costless and instantaneous (Szulanski, 2000). And the lack of a clear-cut definition or proven best practice means KT is not easily understood. In this paper, we use Liyanage et al.'s (2009, p. 122) model of KT to analyse the process of knowledge transfer from an entrepreneur to the managers that will ultimately see the start-up succeed or fail. Liyanage et al. describe KT as follows:

Knowledge transfer is about identifying (accessible) knowledge that already exists, acquiring it and subsequently applying this knowledge to develop new ideas or enhance the existing ideas to make a process/action faster, better or safer than they would have otherwise been. So, basically knowledge transfer is not only about exploiting accessible resources, i.e. knowledge, but also about how to acquire and absorb it well to make things more efficient and effective.

SMEs are widely considered to be the lungs of the world economy (Massaro et al., 2016), yet only 50% survive beyond five years (Wee and Chua, 2013). Such stark statistics provide a compelling motivation to study the early stages of SME development and the actors that breathe life into these vital economic enterprises, making their knowledge management practices particularly important. In fact, where competition is not based on physical and financial capital, as is typically the case for SMEs, the knowledge, experience, and skills of the people involved in a business become especially relevant to its survival (Man et al., 2002).

Through this empirical case study, we seek to describe the role of the entrepreneur in driving business performance from a KT perspective. We also provide practical insights to improve the long-term resilience of SMEs. A literature review of learning through KT in SME start-ups is provided as background, followed by our research question. We then present the Birra Flea case study using Liyanage et al.'s (2009) framework to identify the key components of the KT process for analysis. Our findings, conclusions, and perspectives on future research complete the paper.

Literature review

This literature review explores how small enterprises, especially start-ups, use knowledge to begin and grow. Knowledge plays a crucial role in creating value for companies and has a major influence on their survival. Penrose (1959) outlines two kinds of knowledge relevant to a company's success: entrepreneurial knowledge and managerial knowledge. Entrepreneurial knowledge relates to an individual recognising and developing a business opportunity, and managerial knowledge refers to developing the business processes associated with that opportunity. To understand the learning mechanisms that govern the development of each type of knowledge in the context of our investigation, the following sub-sections outline learning and KT in SMEs as they start up and then develop. The literature review concludes with our research question.

Knowledge transfer in SMEs and start-ups

Massaro et al. (2016) argue that resource constraints, coupled with different managerial capabilities and processes, result in different knowledge management processes for SMEs than for larger companies – a position that has found some consensus over the past few years (Wong and Aspinwall, 2004; Desouza and Awazu, 2006; Durst and Edvardsson, 2012; Wee and Chua, 2013). Wong and Aspinwall (2004) were among

1
2
3 the first to “redress the imbalance by putting KM [knowledge management] in the context of small
4 business”. Contrary to scholarly thinking at the time, they supported the idea that SMEs have specific
5 features that need to be understood before appropriate knowledge management practices can be
6 implemented. Even if the main differences between SMEs and large companies are the size and their level
7 of resources, they also have different characteristics, ideas, and needs. Expanding on this thinking, Desouza
8 and Awazu (2006) outlined five aspects of knowledge management peculiar to SMEs: the dominance of
9 socialisation in the SECI cycle (Nonaka, 1991; Nonaka and Takeuchi, 1995; Nonaka and Toyama, 2003); the
10 prominence of common knowledge; a moderate fear of losing knowledge through employee attrition; a
11 tendency to exploit external sources of knowledge; and the centrality of people in knowledge management
12 practices. Their study concludes with the assertion that it is wrong to assume an SME’s KM practices are
13 similar to larger organisations.
14
15

16 Durst and Edvardsson (2012) provide further important insights, explaining that SMEs are different from big
17 companies because SMEs tend to be informal and non-bureaucratic with few rules or structures. Also,
18 controls tend to be based on the owner/manager’s personal supervision. Coupling this kind of structure
19 with a lack of financial sources and expertise (Bridge and O’Neill, 2012) contributes to a concentration of
20 knowledge in the mind of the owner and a few key employees (Durst and Edvardsson, 2012), which
21 ultimately leads to an informal type of KT. Wong and Aspinwall (2004) describe informal KT as “corridor
22 knowledge sharing”. Durst and Wilhelm (2012) describe it as knowledge sharing during company birthday
23 parties.
24
25

26 In analysing why KT is so important for SME start-ups, part of the answer is given by Wee and Chua (2013),
27 who argue that less than half of SMEs survive beyond their fifth year. Man et al. (2002) argue that where
28 competition is not based on physical and financial capital, the knowledge, experience, and skills of the
29 business’s owner and its employees become especially relevant to the company’s survival. Given that
30 intellectual capital (Cuozzo et al., 2017) is, arguably, the most abundant asset for most SMEs when starting
31 up, these claims when combined make the knowledge management practices of SMEs particularly
32 important. The social and economic importance of SMEs has led other scholars to study start-up processes,
33 with contributions that impact on the KT literature. For instance, Kolvereid and Isaksen (2006) studied
34 start-ups in the Norwegian context, noting the importance of transferring the entrepreneur’s knowledge to
35 business processes in order to create new business ventures with positive occupational impacts.
36
37

38 Learning during the start-up and development phases of SMEs

39 There is particular interest within knowledge management research on the development of small firms and
40 the role that creating, capturing, and transferring knowledge plays in Penrose’s (1959) argument – i.e., that
41 business expansion is associated with the acquisition and application of knowledge (Yli-Renko et al., 2001;
42 Bell et al., 2004; Acs et al., 2009) and with internationalisation (Kuivalainen et al., 2012).
43

44 Zhang et al. (2006) conceptualise the SME learning process with a framework based on interviews with
45 managers. The social relevance of SMEs is described as a location of KM practices to provide an important
46 lens on their evolution. They also note an interesting difference between KT in innovative SMEs and stable
47 SMEs. Stable firms are incremental and adaptive, with reactive KT driven by a limited group of individuals,
48 while innovative firms are more proactive in engaging with external environments. Another contribution by
49 Akhavan and Jafari (2007) comes from the Iranian context, where SME learning practices present basically
50 similar characteristics to other contexts (i.e., the interactive participation of employees and a flat structure
51 with CEO support and commitment). Interestingly, their analysis also outlines the absence of a correlation
52 between the implementation of learning practices and the size of the organisation.
53
54
55
56

1
2
3 KT in SMEs also plays a crucial role in the transition from the start-up phase to the development phase
4 because managing and growing a business is subtly different from the entrepreneurial skills needed to start
5 a business. Furthermore, while creativity and flexibility are “key to initiating the experiences necessary to
6 explore new opportunities, management and technical competence are important” (Macpherson and Holt,
7 2007, p. 178). Development requires business results and, of course, for the organisation to survive (Hsu,
8 2006), which is why scholars have explored so many different aspects of this issue. Lee and Jones (2008),
9 for instance, focus on the role new communication instruments play in the learning process and how
10 entrepreneurs use them to acquire the social capital necessary to support business development. Midler
11 and Silberzahn (2008) use an analytical framework based on three bodies of knowledge – project
12 management, organisational learning, and entrepreneurship – to examine how the development phase of
13 start-ups are managed through a succession of exploration projects. Focusing on Taiwanese high-tech
14 firms, Wu (2007) demonstrates that dynamic capabilities significantly help to leverage entrepreneurial
15 resources that benefit start-up performance. In a similar direction, Van Gelderen et al. (2005) demonstrate
16 that learning is a vital issue when starting a small business because it helps to improve short- and long-term
17 business performance, promotes personal development, and brings a sense of personal satisfaction.
18
19

20 Macpherson and Holt (2007) undertook a dedicated review of the empirical evidence in support of learning
21 in SMEs during start-up and development. They investigate the specific entrepreneurial and organisational
22 factors that impact upon small firm learning and knowledge management and their links to growth,
23 outlining the different aspects discussed within the research stream. Much of the literature deals with the
24 role of the entrepreneur and the management team in terms of their human capital and developing
25 systems of management and social capital, but some focuses on systems and their function in providing
26 absorptive capacity (Alavi and Leidner, 2001).
27
28

29 In terms of entrepreneurial and managerial human capital, scholars attribute the success of the start-up
30 and the growth to the personal aptitude of the entrepreneur and their ability to remain open to learning
31 from experience (Gray & Gonsalves, 2002). In this view, some knowledge sources are identified as key:
32 relevant industry experience (Jo and Lee, 1996), soft managerial skills (Leach and Kenny, 2000), and prior
33 business experience in formal planning (Olson and Bokor, 1995). In other words, research on human capital
34 suggests that entrepreneurial quality (Kakati, 2003) requires a broad range of abilities for translating
35 resources into rents.
36

37 Two main aspects of an entrepreneur’s ability to create structures, systems, processes, and a culture that
38 enables knowledge application, learning, and growth (Barnett and Storey, 2001; Gray and Gonsalves, 2002)
39 have been analysed: (a) the influence of the entrepreneur on the practice of organising; and (b) the
40 entrepreneur’s role in “creating a context in which knowledge and learning are valued” (Macpherson and
41 Holt, 2007, p. 179). This branch of the literature claims that the entrepreneur’s ability to create
42 organisations and activities that support KT and encourage learning is an important antecedent for growth.
43 Nevertheless, some authors clearly state that organisational technologies complement but remain
44 influenced by the entrepreneur’s decision making and technical ability (Choi and Shepherd, 2004; Perren
45 and Grant, 2000; Lefebvre et al., 1995).
46
47

48 Concerning the role of the entrepreneur’s social capital, both personal (Greene, 1997) and professional
49 (Lechner and Dowling, 2003) networks have been analysed as factors able to favour KT: “successful
50 knowledge transfer and learning through network requires specific social skills” (Macpherson and Holt,
51 2007, p. 180).
52

53 Another stream identified by Macpherson and Holt (2007) focuses on systems used as independent
54 knowledge management tools, within and across firm boundaries. Some scholars (Cagliano and Spina,
55
56

2002) particularly focus on the distinction between the bureaucratic management systems that support performance management and quality improvement and the systems that support participation, empowerment, and innovation (Trequattrini et al., 2016). Another group of studies more explicitly investigates the influence of organisational boundaries, claiming that organisations with the ability to acquire knowledge externally and distribute it internally are more competitive (Lichtenstein and Brush, 2001; Corso et al., 2003; Liao et al., 2003). According to these scholars, systems are adjusted in the exploitation period to expand knowledge, and old systems are abandoned during the exploration period in favour of new ones that capture new intangible sources of knowledge (Macpherson and Holt, 2007).

Moving forward from this literature review, the aim of our research is to explore the role the entrepreneur plays in the KT process of a start-up and how that role changes during the development phase of an enterprise. Therefore, the question guiding our research is:

- What features characterise an entrepreneur's KT during the start-up phase of a new enterprise and how might those features change during the development phase?

Research methodology and data collection

A case study methodology is appropriate for answering this research question because it allows researchers to "capture various nuances, patterns, and more latent elements that other research approaches might overlook" (Berg, 2007, p. 318). This is especially so where the actions of participants form the main subject of an investigation. Case studies also allow the use of a comprehensive set of data collection methods (Creswell et al., 2007, p. 75), such as direct observations, participant observations, interviews, and the analysis of documentation, archival records, and physical artefacts (Yin, 2014, p. 106). Birra Flea is an appropriate subject for study because it represents a good example of a successful start-up company operating in a unique and growing segment of the craft beer industry. And its development derives from KT processes involving the entrepreneur. For Birra Flea, KT is a relevant and complex process. As researchers, we were provided with an opportunity to investigate issues relevant to our research question in a practical context where the participants' experiences were critical to the outcome (Bhattacharjee, 2012), but where we had little or no control over their behaviour (Yin, 2014, p. 14). Corroborating our observations with additional data sources allowed us to "clarify meaning by identifying different ways the phenomenon is being seen" (Stake, 2000, p. 444), and to synthesise the evidence and validate our findings through triangulation (Yin, 2014, p. 120). Additionally, these data provided a rich array of evidence for understanding the social and operational context in which KT is implemented, and make that context "intelligible to the reader" (Dyer and Wilkins, 1991, p. 634). Practitioners will be able to translate our findings into day-to-day practice, with an awareness of the steps that are crucial in both the start-up and development phases.

To support our analysis, a research protocol was implemented following the prescriptions stated in Yin (2014). This protocol was used to validate the results in terms of construction, internal, and external validity. Tables I and II present the validation strategy.

Table I – Validation of the results

Ensuring the selected case is an appropriate subject for study is the first step in internal validation. We chose Birra Flea because of the outstanding results they have achieved compared to the standard growth path of their competitors. While a normal craft brewery would usually take several years from commencing operations to develop a production capacity of 100,000 bottles, Birra Flea was able to ship this amount within six months of their first customer request. Further, one particular characteristic of the case study –

1
2
3 the entrepreneur – supports the case study's internal validity, as, through him, we were able to isolate the
4 business results from the influence of features that are not under consideration.

5
6 A common critique of the case study methodology involves problems with the generalising the findings. Yin
7 (2014, p.48) counters that case studies are not designed to provide statistical generalisations. Rather, they
8 seek to deliver analytical generalisability from the observations of a phenomenon with the aim of offering
9 theoretical explanations that can be applied to identify similar cases. Given one of our aims is to provide
10 insights beyond mere empirical descriptions, we externally validated our conclusions with a triangulation
11 process comprising our data sources and external references. Table II outlines the external validation
12 strategy. The sources listed in the last column are further detailed in Table III.
13

14
15 *Table II - External validation strategy*
16

17 18 Birra Flea's start-up and development process

19 Birra Flea is a small enterprise located in Gualdo Tadino in the Italian Region of Umbria. Established in 2013,
20 the company exclusively focuses on producing and selling beer. Within its first three years of operation,
21 Birra Flea has shown exceptional performance in terms of production capacity, the number of customers
22 and markets served, product variety, and product excellence.
23

24 25 Production capacity

26 Birra Flea commenced production with a small brewing plant, including bottling and packaging equipment,
27 and an initial capacity of 2.250hl per year. After three years, their production capacity had increased to
28 8.144hl – an expansion of more than 260%. Their current bottling and packaging capacity is over 10.000hl
29 per year.
30

31 32 Customers and markets

33 The company's first order was for 100,000 bottles of a private-label beer brand for a major distribution
34 chain to be produced within six months of the date of the order. As a result of this successful experience,
35 Birra Flea began to develop its own line of craft beers. They designed the beers to meet the tastes of
36 various markets for both private labels and their own line of Flea-brand beers. By 2016, their turnover had
37 reached €2 million. Flea beers account for approximately 60% of sales and are primarily sold to hotels,
38 restaurants, and through catering channels. The remaining 40% is related to private-label products, mainly
39 for large supermarket chains and modern distribution. The company currently serves over 2000 customers,
40 and its line of products includes 10 different brands.
41

42 43 Product variety and excellence

44 During its short history, Birra Flea has also received several important awards certifying their high level of
45 technical knowledge. In 2015, Flea beers were recognised among the seven coolest craft beers of Italy by a
46 jury of national beverage experts. In 2016, two of their four original-recipe beers won first prize in a
47 national contest sponsored by the Associazione Unionbirrai (United Brewery Association). At the end of
48 that year, they won second and third prize at the China Beer Awards, an international competition
49 established in Hong Kong where the beers are judged by a jury of 11 independent experts from China, Hong
50 Kong, and Taiwan.
51

52 53 The entrepreneur

54 The architect of Birra Flea is the owner of the brewery, Matteo Minelli, a young entrepreneur with past
55 success in the start-up and development process of a renewable energy company listed on the Alternative
56 Italian Market (AIM). Minelli started his career in a small family-owned building and construction company.
57

1
2
3 Taking inspiration from a trip to Germany, he anticipated impending market saturation and diversified the
4 family business into photovoltaic plant installations. He was the first entrepreneur in the territory to invest
5 significant resources in large owner-operated energy production plants, taking advantage of all the
6 incentives energy production brings. A new company was founded in 2008 and, with substantial
7 momentum in sales, customers, and profits, it reached a significant turnover of €60 million within a few
8 years. In 2013, to boost financial development and prepare the organisation to work on a larger scale, the
9 company listed on the AIM on the Milan Stock Exchange.
10

11 Concurrently, Minelli was also responding to a passion for craft beer. In founding Birra Flea, he was
12 transposing his entrepreneurial experience to a whole new industry, and this would prove crucial to the
13 launch of the brewery.
14

15 Data collection

16 The case data were principally gathered between September 2016 and May 2017. The sequence and
17 timeline of the data collection began with an initial interview with Minelli to capture his story in narrative
18 form. After three more informal meetings and visits to Birra Flea as observers, seven semi-structured
19 interviews with Minelli and key participants in the start-up were conducted to focus on specific aspects of
20 the KT process.
21
22

23 The informal meetings and interviews averaged 60 minutes in length. They were tape-recorded and then
24 transcribed. When tape recording was not possible, notes were taken. Following an inductive approach,
25 meetings with interviewees involved open questions. Since data gathering and data analysis were
26 conducted in parallel, we were able to pose increasingly specific questions and probe deeper into initial
27 ideas as the project and data collection progressed. The interview data were complemented with relevant
28 internal documents, and other media sources. Table III lists the details of the collected data along with the
29 references used to present the results.
30

31 *Table III: Sources of the collected case study data*
32
33

34 Data analysis involved several iterative rounds of reflection between data and theory, as well as
35 triangulating the data from different sources (Yin, 2014, pp. 120-1). An ongoing research relationship with
36 the subject of the case study provided us with the opportunity to test our initial theoretical understandings
37 with key informants throughout the data gathering and analysis phase. The overall analysis was also
38 verified and accepted as accurate by multiple key informants at Birra Flea (Yin, 2014, pp. 120-2).
39
40

41 Analytical framework

42 This section presents a description of the Liyanage et al. (2009) theoretical framework we used to interpret
43 the data – hereafter referred to as the Liyanage framework. This framework identifies some of the key
44 components in the KT process, such as relevant knowledge, sources and receivers, knowledge transfer
45 steps, and other elements that describe the form of transfer and measure its effectiveness.
46
47

48 Of the different models found in the literature (Liyanage et al., 2009; Tangaraja et al., 2015; Welschen et
49 al., 2012; Paulin and Suneson, 2012), the Liyanage framework, shown in Fig. 1, makes the most significant
50 contributions because it delineates the elements that KT entails (Tangaraja et al., 2015). Moreover, the
51 Liyanage framework is consistent with Argote et al.'s (2000) model, which specifies that KT can occur at
52 both the individual and higher levels (groups, departments, divisions), not just at higher levels as claimed
53 by Paulin and Suneson (2012). We believe these features are particularly important for analysing the start-
54 up and development phases of a company, where KT can occur at any level or stage.
55
56

1
2
3 Additionally, the Liyanage framework outlines that, in KT, active participation by the knowledge source and
4 the knowledge receiver is crucial (Tangaraja et al., 2015), even if the parties are not able to transfer
5 knowledge due to the inherent difficulty of the task (Liyanage et al., 2009). Cranefield and Yoong (2005)
6 assert that KT will only be successful if an organisation has “not only the ability to acquire knowledge but
7 also the ability to absorb it and then assimilate and apply ideas, knowledge devices and artefacts
8 effectively”. Consequently, together with a willingness to share and acquire knowledge, one of the most
9 critical factors for KT success is the receiver’s “absorptive capacity” (Liao et al., 2003).
10

11 *Figure 1: Knowledge transfer: a process model:*

12
13
14 *Source: adapted from Liyanage et al., 2009.*

15
16 The knowledge transfer process in the Liyanage framework has three main components. In the first step,
17 the KT process is interpreted as an act of communication between a source and a receiver, focusing on
18 identifying a source and a receiver with the willingness to share and acquire the relevant knowledge
19 (Carlile, 2004).
20

21 Second, the process of transfer is divided into six steps:

22
23 **Awareness** perceives a gap and identifies the knowledge that needs to be transferred from the source to
24 the receiver;

25
26 **Acquisition** is the entity’s ability to select and acquire externally generated knowledge that is critical to its
27 operations (Zahra and George, 2002);

28
29 **Transformation** translates acquired specialist knowledge to make it useful for general purposes;

30
31 **Association** connects transformed knowledge to the internal needs and capabilities of the entity, making it
32 useful for the receiver;

33
34 **Application** brings the acquired, transformed, associated knowledge to bear on the problem at hand. This
35 is the most significant step during the KT process and is the only step that leads to improved performance
36 or creates value (Liyanage et al., 2009); and

37
38 **Externalisation** disseminates the knowledge through a feedback process. Successful KT should not be a
39 one-way process where the receiver takes the bulk or all the benefits. KT should add value for both the
40 receiver and the source, and lead to enhanced collaborations and relations.

41
42 In reality, the KT process may take less than six steps if the source and receiver are similar contextually,
43 technically, or structurally (Liyanage et al., 2009).

44
45 Third, the Liyanage framework provides three supporting elements.

46
47 **The form of knowledge transfer:** four modes of knowledge transfer between the source and the receiver
48 are borrowed from Nonaka and Takeuchi’s (1995) knowledge conversion model: externalisation
49 (tacit→explicit), combination (explicit→explicit), internalisation (explicit→tacit), and socialisation
50 (tacit→tacit).

51
52 **Performance measurement:** to assess the accuracy and quality of the knowledge acquired and its impact
53 on the organisation and practices.

54
55 **Intrinsic and extrinsic influences:** intrinsic influences are person-specific, cultural, or organisational.
56 External influences include environmental, technological, political, and socio-economic factors. Each has

57
58
59
60
8

several dimensions of context (culture, capabilities, skills, etc.) and either can positively or negatively impact the KT transfer process.

These components of the framework constitute the analytical constructs for the design and the analysis of the case using the following approach:

- 1) key knowledge relevant to Birra Flea's start-up phase was identified;
- 2) relevant sources and receivers of knowledge were identified;
- 3) key pieces of KT were mapped into the six steps; and
- 4) supporting elements were identified.

After analysing the start-up phase, we focused on potential KT changes during the development phase with a twofold aim. First, to investigate how the structural elements of the KT process might change during the development phase. Second, to provide entrepreneurs with practical tools to help manage KT as their company grows.

Findings

In this section, the start-up phase at Birra Flea is analysed through KT constructs, revealing two KT processes: one from external sources to the entrepreneur and another from the entrepreneur to the organisation. Through this interpretive research, the characteristics of the KT process and the role of the entrepreneur during the start-up phase are described. The section concludes with the changes likely to occur during the next phase of Birra Flea's development.

The first interview with Minelli specifically focused on knowledge transfer, revealing two KT processes at Birra Flea. On the one hand, Minelli recognised having acquired knowledge from external sources; on the other hand, he also acknowledged transferring this knowledge to internal staff and into Birra Flea's business processes in order to set up the brewery:

Without acquiring knowledge from one side to transfer it to another side, companies would shut down. You must firstly document yourself and then relocate to those who might be the most valued, most enlightened contributors, which is the hardest thing to find. (IS1)

This KT chain created a unique opportunity to analyse both processes independently: from external sources to Minelli, then from Minelli to the business. The following sub-sections systematise each process in turn.

Knowledge transfer from external sources to the entrepreneur

What emerged from the first interview with Minelli is his belief that three pieces of knowledge have been relevant to the brewery's development:

- general knowledge about business planning;
- product knowledge regarding different kinds of beer and production technologies; and
- market knowledge.

These three key findings are reinforced because they broadly align with the Rae (2005) entrepreneurial learning model categories of "personal and social emergence; the negotiated enterprise; and contextual learning" respectively. However, rather than drawing exact parallels to how or which knowledge is learned in each of these categories, we use the theoretical constructs in the Liyanage framework to analyse these three types of learnings as streams in a process knowledge transfer. The process of knowledge transfer at Birra Flea resulting from our analysis of the interviews conducted with Minelli and key sources IS2 and IS3 is presented in Table IV.

Table IV: The process of transferring knowledge from external sources to the entrepreneur

Planning and control knowledge

The key source of this knowledge was IS5, a financial consultant who has assisted Minelli since 2008. As a graduate in business administration, a tax consultant, a specialist in the energy sector, and the partner of a consulting firm specialising in finance and company valuations, IS5 has strong skills in planning and control.

Minelli was acutely aware of the importance of this knowledge in planning for cash flow and returns on investment at the outset of the business (IS1; IS5; IS6). He had already acquired some of this knowledge through collaborations with IS5 in his previous business, especially through that company's listing process on the AIM (FN1; IS1; IS5). The ability to transform complex planning and control mechanisms drawn from a stock exchange listing in a completely different industry and scale them down to a start-up was vital (IS5; IS6). Operationally, the knowledge was applied while preparing a business plan for the brewery (IS5; IS6; IS5) and was externalised with a formal presentation to potential partners during the start-up phase (IS1; IS5; IS6).

IS5 summarises this process, emphasising the prior experience of planning and standardising business processes at an industrial scale:

Before the company was set up, a business plan was developed, an unusual practice considering the initial dimension of the brewery. This has been done through the transfer of knowledge deriving from the listing process of the previous company on the stock exchange, making clear the need to plan the cash flows.

What was initially tacit knowledge had been transferred through continuous dialogues between Minelli and IS5 (FN1; FN2; IS5) and became explicit through a reporting, control, and planning model. From a qualitative perspective, the success of the KT can be measured by Minelli's ability to understand and apply planning and control mechanisms to prescribe the business's evolution (IS4; IS6) – an unusual practice in the craft beer industry, as stated above.

From the interviews conducted with Minelli and IS5, it is clear that some of Minelli's personal characteristics also positively influenced the process, particularly his open-mindedness, courage, humility, and passion (IS1; IS5). In Minelli's own words:

Passion is fundamental. Without passion, we can't do nothing. As entrepreneurs, it is necessary to have mental openness and do not make any secrets on anything. Even in moments of difficulty, share joys and sorrows with the closest collaborators, even because the solution could pull them out directly. (IS1)

In this phase of knowledge acquisition, two phenomena highlighted in the literature are clearly observable: a tendency to exploit external sources of knowledge (Desouza and Awazu, 2006) and the importance of prior learning events (Cope, 2003). Minelli exploited his connection with a key resource to extract knowledge about a prior learning event – the listing of his company on the AIM. These phenomena help us to understand the entrepreneur's knowledge acquisition process.

Product knowledge

IS3 is Birra Flea's Master Brewer and Minelli's key source of product knowledge (IS1). He is an agriculture graduate with a PhD in food biotechnologies, specialising in beer, and many years of experience as a brewery consultant and a technologist at a beer research centre.

1
2
3 Minelli stressed the need for a high level of expertise to achieve his goals (IS1; IS3; FN2). Minelli knew IS3
4 was about to leave another brewery, and they began collaborating six months prior to launch (IS1; IS3;
5 FN2). Through their work together, IS3's product knowledge progressed into a search for the best taste
6 varieties to suit their markets (FN3; IS3). Minelli established explicit research protocols, and they conducted
7 experiments in the micro-plant, signalling the application of product knowledge. After many internal tests,
8 the knowledge was externalised through four basic recipes (IS1; IS3).
9

10 Tacit knowledge was rapidly codified into experimental protocols, which led to four recipes that are now
11 the foundations of Birra Flea's value proposition (FN2; IS1; IS3).
12

13 As Minelli puts it:

14
15 *I tried to get the best knowledge available in the beer field asking that all the recipes that were*
16 *being developed had to be prepared according [to] explicit protocols kept in [a] safe, signing a*
17 *non-competition pact out of the brewery or inside the brewery. This is a typical problem for*
18 *handmade micro-breweries, but also for many other companies where knowledge and know-*
19 *how are the exclusive property of those who play a key role in the final product. So, in my*
20 *opinion, this is still value added because this transfer of knowledge from the one who is a*
21 *central person within the brewery to the entire organisation has been fundamental. (IS1)*
22

23 Minelli's desire to develop an industrial-scale production system with good margins and an adequate
24 variety of flavours was critical to the success of this KT. IS3 recognised this:
25

26
27 *I've done laboratory protocols like in the research projects. I already knew I had to develop four*
28 *recipes. I pointed to what I think could be four beers of four different styles, with the aim to*
29 *make one of them please for everyone. There must be a beer for each taste. (IS3)*
30

31 In the knowledge acquisition phase, individualising external sources is fundamental to KT (Desouza and
32 Awazu, 2006). However, unlike organisational learning where informal and non-bureaucratic structures
33 support the spread of knowledge (Durst and Edvardsson, 2012), here, surprisingly, formalising the process
34 helped KT. Minelli codified the experimental protocols used to develop the recipes, in effect, formalising
35 ID3's knowledge. Moreover, we observed Minelli's great interest as his position in the technical aspects of
36 the business became more central. This inclusion of outside externalised knowledge, in the form of a
37 feedback loop, would become a main driver for the organisation (Choi and Shepherd, 2004; Perren and
38 Grant, 2000; Lefebvre et al., 1995).
39

40 Market knowledge

41 Minelli cites open access knowledge from the web and the study of his competitors' market choices as his
42 main sources of market knowledge (IS1; WM4-6). His goal was to market the authenticity and originality of
43 a handcrafted product line at a consistent price point (IS1; IS2). He scoured forums and blogs where beer
44 experts and aficionados were known to share their opinions and preferences and, when he found a product
45 gap with an appropriate taste and price for his own start-up, his general understanding of the market was
46 transformed into specific knowledge (IS1; IS3). This step led to an association with the product knowledge
47 as he evaluated ID3's experimental recipes from the perspective of the market gap he had perceived (IS1;
48 IS2). Market knowledge was then applied when the final four recipes were chosen, and it was externalised
49 when they were offered to potential customers to test. Customer appraisal now constitutes one of the
50 basic pillars of the Birra Flea value proposition (IS2).
51
52

53 Throughout the process, KT moved from acquiring explicit knowledge from the web to tacit knowledge (IS1;
54 IS2). Performance measurement was a decisive factor. Customer feedback helped Minelli improve the
55 quality of the beer to suit his market's preferences (FN2; FN3; IS1; IS2). This knowledge acquisition was only
56
57

possible because of Minelli's willingness to meet the taste demands of customers and produce a beer with wide appeal. And it worked; the Birra Flea 'style' Minelli created has already lead to several award-winning handcrafted beers (IS2; IS7; WM3; WM7).

According to IS2, Birra Flea's Commercial Manager:

[Minelli] taught us a lot about the Flea style, that after four years we bring to our meetings; and in this Flea style there is always the willingness to satisfy the tastes of consumers.

This form of KT expresses the power of socialisation in the process of acquiring knowledge. Even though Minelli is not a marketing expert, he had the intuition to extract the knowledge he needed from potential customers, confirming Desouza and Awazu's (2006) thesis on the dominance of socialisation in SME knowledge acquisition.

Knowledge transfer from the entrepreneur into business processes

From Minelli's perspective, the second process of KT was a crucial part of the organisational, production, and commercial processes that led to starting up the brewery. The knowledge he gained from external sources was transposed into the business processes of the organisation through some key figures in the brewery (IS1). The relevant knowledge transferred to the business processes concern:

- accounting and control knowledge to periodically measure and monitor performance;
- production knowledge, which was particularly important for efficiently managing supply chains, storage, production, and packaging processes; and
- marketing and commercial knowledge, to adequately support sales goals and improve the company's brand reputation and value proposition.

Again, adopting the theoretical constructs in the Liyanage framework, the KT processes for these pieces of knowledge were mapped, and the results are provided in Table V.

Table V: The process of transferring knowledge from the entrepreneur into business practices

Accounting and reporting knowledge

Minelli identified IS4, Birra Flea's Administrative Manager, as the key receiver of his accounting and control knowledge (IS1). Despite graduating in business administration and having significant previous experience in the management control department of a multinational company (Black & Decker), Minelli wanted to personally focus on introducing her into the organisation (IS4).

Given her previous experience and Minelli's need for systematic reporting (IS1; IS4; IS6), IS4 was keenly aware of the importance of accounting and control procedures at a very early stage, but her knowledge needed to be transformed to suit a new professional setting (IS1; IS4). Now working in a smaller context, IS4 had to collaborate with other business functions during the start-up phase, coupling administrative, commercial, and production skills to manage inventory (IS2; IS3; IS4) and assist with product pricing. These interactions were particularly important for explaining the bill of materials associated with each recipe. Part of the required knowledge was also embedded in some administrative and financial models drawn from Minelli's prior experience and externalised to create structured reporting tools (IS4; ID6-7).

IS4's advanced skills in accounting and finance were required to transfer Minelli's tacit knowledge into actual liquidity and costing models in Excel (IS4; ID6-7). The models allowed for the constant performance monitoring of cash flow, product costing, and inventory levels (IS6). This aspect of the overall KT process

1
2
3 was positively influenced by both the opportunity for the receiver to achieve professional growth and by
4 allowing Minelli timely access to information (IS1; IS4).

5
6 IS4 reflects on the process:

7 *On the inventories management, the entrepreneur demanded, since the beginning, a*
8 *structured and systematic management and control. As for the product costing and liquidity*
9 *reporting. In short, the control models that I had met in my previous multinational experience*
10 *were applied, even if it was a newly-born business.*

11
12 The tendencies to concentrate knowledge in the mind of the owner and some key employees (Durst and
13 Edvardsson, 2012) and to support the owner/manager in the learning process (Akhavan and Jafari, 2007)
14 observed during this process are coherent with findings in previous literature.

15 16 17 Production process knowledge

18 ID3, the Master Brewer, began his relationship with Birra Flea as a consultant during the start-up phase and
19 was subsequently hired as the Production Manager. Because of his specific skills and role, ID3 was
20 identified as the key receiver for the knowledge required to standardise production and design a plant that
21 was ready for future increases in production (IS1).

22
23 Production processes are integral to steady growth in production capacity (IS1; IS3; IS7). ID3 provided this
24 knowledge through his previous skills and experience, allowing the organisation to implement solutions
25 tailored to realise this growth. The collaborative relationship Minelli and ID3 had nurtured while working on
26 product development now progressively evolved into a knowledge transfer about production processes
27 (IS1; IS3; IS7). ID3's knowledge was applied to the design and implementation of the production plant (IS3;
28 IS7), which has so far proven capable of meeting growing market demand (IS1; IS3; IS7).

29
30 ID3's implicit knowledge was transferred to the organisation through the choice of machinery and by
31 defining work cycles; however, at this stage, his presence and knowledge were still fundamental because
32 there were no other specialised staff who could autonomously coordinate the entire production process
33 (IS7).

34
35 This aspect of the KT was influenced by Minelli's goal to improve the size of the business and build an
36 organisation independent of his daily presence (IS1; IS3; IS7). On a production level, IS3 notes the foresight
37 present in their planning:

38
39 *From the production point of view, everything has always been designed in an evolving way*
40 *aiming to growth. Even with the high production increments, production processes have never*
41 *been changed profoundly. Also in predicting future investment, the production cycle will not*
42 *undergo major changes.*

43
44
45 The tendency to concentrate knowledge in the mind of the owner and some key employees (Durst and
46 Edvardsson, 2012) is also present in this knowledge transfer, along with Minelli's interest in gaining a
47 central position as the level of technical knowledge in the production process evolved (Choi and Shepherd,
48 2004; Perren and Grant, 2000; Lefebvre et al., 1995).

49 50 Marketing knowledge

51 Marketing knowledge was transferred when training IS2, Birra Flea's Commercial Manager, and the key
52 receiver of business process knowledge. For this role, Minelli chose a high school friend with solid
53 experience in agricultural trade associations and relationship management, but without specific
54 commercial experience.

Marketing knowledge was always considered relevant for realising Birra Flea's value proposition and developing the market share needed to gain a return on investment (IS1; IS2). Minelli served as IS2's coach to further develop his already well-developed customer relationship skills (IS1; IS2). This knowledge progressively evolved into scouting missions and research for new market opportunities alongside customer relationship management (IS2). To achieve their goals, marketing and commercial knowledge had to be associated with product knowledge to provide IS2 with a sufficiently in-depth understanding of each product's characteristics. Administrative knowledge associations were also required for accurate product costing (IS2; IS3; IS4). These associations embedded the Birra Flea value proposition into the business processes. The resulting Birra Flea 'style' was then externalised as IS2 began to manage business relationships independently, except for the larger ones that still involve Minelli (IS1; IS2; IS3).

Minelli transferred his tacit knowledge to IS2 by affiliation and socialisation in order to acquire new customers (IS1; IS2), which then grew under IS2's management into a commercial network of over 2000 customers. However, the KT was only partial because, as outlined in the interviews (IS1; IS2), Birra Flea's relationships with their largest customers remain tied to Minelli. IS2 explains:

I think I have made significant growth in the business sector and following what Matteo says to go on alone, but transferring this experience is impossible because it comes from an innate decision-making aptitude. Someone like Matteo has something that is not the experience. It's more like something that you have or do not have. If you have it, coupled with the experience, situations and many other things become more easily manageable. (IS2)

Minelli's attempts to balance the dissemination and retention of knowledge with his role as entrepreneur heavily influenced this KT process; however, overall, his strong orientation toward catering for customer tastes characterise the process. This is in keeping with a partial concentration of the knowledge in the mind of the employees (Durst and Edvardsson, 2012), as Minelli maintained control of the most strategically relevant relationships rather than delegate them to organisational technologies (Choi and Shepherd, 2004; Perren and Grant, 2000; Lefebvre et al., 1995).

Discussion: The entrepreneur's role in KT processes during start-up and development

Applying the Liyanage model, the Birra Flea case illustrates how KT in a start-up took place in two cycles. As shown in Figure 2. Minelli triggered the first cycle of KT from external sources into business processes, and our analysis shows that the first important factor of KT is a combination of entrepreneurial passion and exploiting knowledge from past experiences. As IS2 points out:

We started with a lot of expertise, know-how, and Matteo's experiences as an entrepreneur in other areas.

Previous experience had an impact on Minelli's ability to plan for the business and how to combine various forms of knowledge to establish necessary functions within the brewery, such as production and marketing. Other factors, such as a desire for growth also had a great impact, especially during the start-up phase. IS5, in commenting on the factors leading to the brewery's success, notes:

For my experience, I could describe Matteo's entrepreneurship with three adjectives: passion, desire for growth and new realities, and intelligence.

What made the most difference in the acquisition and subsequent application of relevant knowledge was Minelli's strategic orientation. He had a business idea and projected that idea into a medium- to long-term development horizon. As he explicitly states:

To understand the market and consumers' tastes you can refer to statistics or sites as references, but they provide very macro and general information. The whole process depends on what you have in mind to do and how you see the positioning of the brewery in the medium-long term. (IS1)

Coupled with his entrepreneurial abilities and "absorptive capacity", Minelli's strategy drove him to identify "knowledge relevance" and "knowledge gaps". These were first filled through an individual acquisition path, then socialised when selecting his collaborators and establishing the brewery. In this sense, Minelli typifies what the literature defines as a "passion for inventing" and a "passion for founding" (Breugst et al., 2012) – two aptitudes that led Minelli to further extend the KT process into organisational processes.

We can conclude that, in the start-up phase, Minelli is a selective "broker" of knowledge, driven by curiosity, passion, and strategy, who takes part in the KT process with a twofold role: as both a source and a receiver. This way, he is able to trigger a combined process of entrepreneurial and organisational learning, as Fig. 2 shows.

Figure 2 – KT during the start-up phase

Entrepreneurial learning, from external sources to the entrepreneur, is interpreted in experiential learning theory (Bailey, 1986; Cope and Watts, 2000) as "the process whereby knowledge is created through the transformation of experience" (Kolb et al., 2001). The second cycle of KT, from the entrepreneur into business processes, gradually activates organisational learning. Dutta and Crossan (2005, p.433) define this type of learning as "the capacity or the process within an organization to maintain or to improve performance on the basis of experience, a capacity to encode inferences from history or from experience into routines that guide future activity and behavior, systematic problem solving, and ongoing experimentation".

Presently, the company is planning a further stage of significant development, which raises questions about its absorptive capacity. According to Liao et al. (2003) "organizational absorptive capacity" includes two fundamental elements: external knowledge acquisition and intra-firm knowledge dissemination. External knowledge acquisition refers to a "firm's ability to identify and acquire externally generated knowledge that is critical to its operation" (Zahra & George, 2002). Intra-firm knowledge dissemination means "information gathered from the business environment that should be transferred to the organization and then transformed through the internalization process that requires distinction and assimilation". Our interviews in the start-up phase portray Minelli's predominant role in both externally generated knowledge acquisition and intra-firm knowledge dissemination. Even though his desire for a central place in the learning process is clear (Choi and Shepherd, 2004; Perren & Grant, 2000; Lefebvre et al., 1995), Minelli's words emphasise the need to make the learning model more independent of his presence. As Dosi et al. (2001) point out, organisational structures only create benefits for business processes when they are able to spread and "disseminate" learning beyond the entrepreneur.

Minelli's awareness does entail a greater role for the controller, the need to hire a general manager, and to involve the current brewery managers more:

The role of the controller, in my opinion, will become more and more strategic to keep under control numbers and cash flows. On the other hand, we need to hire a general manager who can be a general supervisor of the business processes. This is the most difficult person to enter the company because he needs to be the closest person to me and a trusted person able to integrate himself within the structure that I would like become independent from my presence. That's why I've implemented a new method for the job interviews, where the managers of the

1
2
3 *company participated to find the right person. In fact, this person has to integrate with them,*
4 *live with them in close contact and collaboration. (IS1)*

5
6 These changes forecast impending modifications to the company's KT model that will move the major
7 driver of KT from Minelli to the organisation (Dutta and Crossan, 2005) and change the transfer process, as
8 shown in Fig. 3. From this, we conclude that Minelli's role during the development phase of organisational
9 learning shifts from KT broker to KT performance controller.

10
11 *Figure 3 – The KT process during the development phase*

12
13 Additionally, members of the organisation will need to directly manage their own external sources of KT
14 and incorporate the knowledge they acquire into organisational learning, just as entrepreneurs must do
15 during the start-up phase. Employees will need to grow if they are to stay aligned with the company's
16 strategies and develop the ability to carefully select both the knowledge and interlocutors needed to fill
17 their knowledge gaps. Minelli must continue to play a key role in monitoring KT performance through
18 results measured by management controls, which could extend to processes, but management controls will
19 need to take on a new challenge – controlling the learning process.

20
21
22 Birra Flea demonstrates that entrepreneurial learning is crucial to the start-up process, and the
23 entrepreneur plays a key role as a KT broker in managing the acquisition and application of knowledge.
24 However, once a business moves into the development phase, that role must be entrusted to a general
25 manager who can fully integrate KT and learning throughout the organisation, leaving the entrepreneur's
26 role free to evolve into a KT controller through KT networking and KT performance measurement.

27
28 Within the Birra Flea case, the role of the entrepreneur and its KT evolution can be discussed by linking the
29 different research streams with an evolutionary perspective (Macpherson and Holt, 2007). In the start-up
30 phase, the contribution of Minelli's human capital in terms of passion (IS5) (Kakati, 2003), open-
31 mindedness (IS1), entrepreneurial experience (FN1), and business planning skills (IS 5, IS 6) is evident. As
32 reported in IS2 and IS4, these characteristics contribute to creating a context where knowledge and
33 learning are fostered (Sadler-Smith et al., 2001). Minelli thus demonstrates the ability to create an
34 organisational system that supports the KT and pursues the growth through learning.

35
36
37 Moreover, as reported in IS 2, Minelli's entrepreneurial style works as an "organizational blueprint"
38 (Spender, 1989) that influences managing Birra Flea. Minelli's social capital contributes significantly to his
39 personal (Greene, 1997) and professional (Lechner and Dowling, 2003) networks, further encouraging
40 learning and KT (Macpherson and Holt, p.180).

41
42 However, in a knowledge systems perspective, the consolidation of "independent knowledge management
43 tools within and across firm boundaries" (Macpherson and Holt, 2007, p. 180) is still in progress in the Birra
44 Flea case. Indeed, the interviews with Minelli (FN3, IS 1) and his partners (IS2, IS3, IS 4) show that the
45 learning dynamics are still strongly influenced by the entrepreneur in his role as KT broker. The analysis
46 demonstrates that the main challenge for the brewery's growth is for the organisation to acquire an
47 absorptive capacity (Cohen and Levinthal, 1990).

48
49 Therefore, as shown in Figure 3, we show the transition from a KT model based on the centrality of the
50 entrepreneur to a model in which the entrepreneur is a KT controller and implies a transformation of
51 absorptive capacity. In the start-up phase, the entrepreneur was the hub of the learning process, but, in the
52 growth phase, the organisation must develop an autonomous absorptive capacity where knowledge is
53 acquired externally and distributed internally (Lichtenstein and Brush, 2001; Corso et al., 2003; Liao et al.,
54 2003). Thus, the exploration and exploitation phases must become independent of the entrepreneur.

55
56
57 16
58
59
60

Conclusion

The start-up phase of an SME is a critical moment where knowledge management can determine the success and the sustainability of the new enterprise. With this research, we shed light on KT practices by examining the KT processes in an award-winning start-up: Birra Flea. Analysing the KT process involved the young entrepreneur Matteo Minelli, four key members of the organisation (consultant, brewer, administrative manager and commercial manager), and several publicly available resources. The analysis shows how the development of the business idea – i.e., experimenting with recipes, identifying customer segments, investment planning, etc. – required a complex combination of knowledge (planning and control, product and market knowledge) that was initially acquired by the entrepreneur and was then transferred into business processes. Conversely, as the business develops and still grows, these KT processes are being reversed, and the knowledge of the entrepreneur is being transferred into the business processes of the enterprise. The theoretical and practical implications of our research are outlined next.

Theoretical implications

To understand the role of the entrepreneur and the characteristics of KT, we adopted the Liyanage et al. (2009) framework that divides the transfer of knowledge from a source to a receiver into six steps. By applying this framework, the Birra Flea start-up is interpreted through a detailed analysis of KT steps that describe how knowledge is transferred from consultants and publicly available knowledge sources to Birra Flea.

Applying Liyanage et al.'s (2009) framework to the case allows us to refine the original framework from an entrepreneurial perspective. In a complex process such as the start-up of a company, KT involves several kinds of knowledge, sources, and receivers that mutually influence each other along the transfer steps. For example, prior experimentation with basic recipes (transferring product knowledge) was fundamental to evaluating customer tastes (transferring market knowledge). Additionally, prior application of planning and control knowledge was necessary for planning the incremental growth of the company's production capacity. Figure 4 outlines these mechanisms and shows the methodological implications of our research with reference to the Liyanage framework (2009).

Figure 4 – Mutual influence of the KT steps of the Liyanage et al. (2009) framework

Our findings outline the fundamental role of the entrepreneur in combining different forms of knowledge by managing the mutual influence of the KT steps. Our findings also outline how Minelli succeeded in combining different forms of knowledge and confirms some key points related to those raised in Macpherson and Holt (2007): (1) the exploitation of planning and control knowledge acquired through previous experience; (2) the exploration of beer recipes and customer tastes for the acquisition of the product and market knowledge; (3) the human capital, passion, and openness that created favourable conditions for the absorptive capacity of the organisation (Garcia-Morales et al., 2006); and (4) the social capital needed to create a favourable context for learning and KT, selecting knowledge from external sources, and transferring that knowledge to Birra Flea.

The ongoing development phase presents another level of complexity. Here, Minelli is changing his role by transforming the company into a knowledge system that is able to realise KT from external sources without his mediation, leaving himself free to manage the organisational absorptive capacity (Cohen and Levinthal, 1990).

Practical implications

The KT interpretation of the company start-up can be extended to different industries and firm dimensions. The case shows that the development of a new business idea requires various kind of knowledge whose identification, acquisition, transformation, association, application, and combination can determine the success or failure of the entrepreneurial initiative. In the craft-beer business, which is characterised by a moderate level of technological complexity and specialisation, Minelli has been able to explore products and markets, while exploiting his planning and control knowledge.

Additionally, the paper offers a practical guide for those wishing to implement KT strategies for a successful start-up. Planning an approach to KT in a start-up requires identifying the types of knowledge needed, the key sources/receivers, and the modes of transfer. While this is usually a tacit and unplanned process, our analysis offers an analytical explanation of the KT process that can serve to identify possible gaps in knowledge, the timing of knowledge acquisition, and the key players to identify as sources and receivers.

Future research

Future perspectives for this research are twofold. First, our evidence sheds new light on entrepreneurial learning that could be examined in light of the underpinning KT. Future research could investigate the entrepreneur's contingent aptitude to apply exploitation and exploration, or could differentiate the types of KT and associated steps according to industry and business characteristics. Second, the business planning literature could be enriched by linking planning accuracy with the effectiveness of the KT process in acquiring products and markets.

Limitations

As outlined earlier, a common critique of case studies is the ability to generalise the findings. However, as Yin (2014, p.48) counters, case studies are not designed to provide statistical generalisations but instead deliver analytical generalisations that offer theoretical explanations that researchers can apply to similar cases.

Acknowledgement

Authors thank the founder of Birra Flea, Matteo Minelli, for his openness and his precious contribution to the development of this paper.

While the paper is the result of a joint effort of the authors, the individual contributions are as follow: Andrea Cardoni wrote "Analytical Framework" and "Findings", John Dumay wrote "Introduction" and "Conclusion", Matteo Palmaccio wrote "Literature Review" and "Discussion: The entrepreneur's role in KT processes during start-up and development", Domenico Celenza wrote "Research methodology and data collection".

References

- Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, 32(1), 15-30.
- Akhavan, P., & Jafari, M. (2007). Towards learning in SMEs: an empirical study in Iran. *Development and Learning in Organizations: An International Journal*, 22(1), 17-19.
- Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 107-136.
- Argote, L., Ingram, P., Levine, J. M., & Moreland, R. L. (2000). Knowledge transfer in organizations: Learning from the experience of others. *Organizational Behavior and Human Decision Processes*, 82(1), 1-8.
- Bailey, J. (1986). Learning styles of successful entrepreneurs. In R. Ronstadt, J. Hornaday, J.R. Peterson, & K. Vesper (Eds), *Frontiers of Entrepreneurship Research* (pp. 199–210). Wellesley, MA: Babson College Press.
- Baker, W. E., & Sinkula, J. M. (1999). The synergistic effect of market orientation and learning orientation on organizational performance. *Journal of the Academy of Marketing Science*, 27(4), 411-427.
- Barnett, E., & Storey, J. (2001). Narratives of learning, development and innovation: evidence from a manufacturing SME. *Enterprise and Innovation Management Studies*, 2(2), 83-101.
- Bell, J., Crick, D., & Young, S. (2004). Small firm internationalization and business strategy an exploratory study of 'knowledge-intensive' and 'traditional' manufacturing firms in the UK. *International Small Business Journal*, 22(1), 23-56.
- Berg, B. L. (2007), *Qualitative Research Methods for the Social Sciences*, Pearson Education, United States of America.
- Bhattacharjee, A. (2012). *Social science research: principles, methods, and practices*.
- Breugst, N., Domurath, A., Patzelt, H., & Klaukien, A. (2012). Perceptions of entrepreneurial passion and employees' commitment to entrepreneurial ventures. *Entrepreneurship Theory and Practice*, 36(1), 171-192.
- Bridge, S., & O'Neill, K. (2012). *Understanding enterprise: entrepreneurship and small business*. Palgrave Macmillan.
- Cagliano, R., & Spina, G. (2002). A comparison of practice-performance models between small manufacturers and subcontractors. *International Journal of Operations & Production Management*, 22(12), 1367-1388.
- Carlile, P. R. (2004). Transferring, translating, and transforming: An integrative framework for managing knowledge across boundaries. *Organization Science*, 15(5), 555-568.
- Choi, Y. R., & Shepherd, D. A. (2004). Entrepreneurs' decisions to exploit opportunities. *Journal of Management*, 30(3), 377-395.
- Cohen, W., Levinthal, D. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly* 35, 128–152.
- Cope, J. (2003). Entrepreneurial learning and critical reflection: Discontinuous events as triggers for 'higher-level' learning. *Management Learning*, 34(4), 429-450.
- Cope, J. & Watts, G. (2000). Learning by doing. An exploration of experience, critical incidents and reflection in entrepreneurial learning. *International Journal of Entrepreneurial Behaviour & Research*, 6(3), 104–124.
- Corso, M., Martini, A., Pellegrini, L., Paolucci, E., 2003. Technological and organizational tools for knowledge management: in search of configurations. *Small Business Economics* 21 (4), 397– 408.
- Cranefield, J., & Yoong, P. (2005). Organisational factors affecting inter-organisational knowledge transfer in the New Zealand state sector-a case study. *The Electronic Journal for Virtual Organizations and Networks*, 7(December).
- Creswell, J. W., Hanson, W. E., Clark Plano, V. L., & Morales, A. (2007). Qualitative research designs: Selection and implementation. *The Counseling Psychologist*, 35(2), 236-264.

- 1
2
3 Cuozzo, B., Dumay, J., Palmaccio, M., & Lombardi, R. (2017). Intellectual capital disclosure: a structured
4 literature review. *Journal of Intellectual Capital*, 18(1), 9-28.
- 5 Desouza, K. C., & Awazu, Y. (2006). Knowledge management at SMEs: five peculiarities. *Journal of*
6 *Knowledge Management*, 10(1), 32-43.
- 7 Dosi, G., Nelson, R., & Winter, S. (Eds.). (2001). *The nature and dynamics of organizational capabilities*. OUP
8 Oxford.
- 9 Durst, S., & Edvardsson, I.R. (2012). Knowledge management in SMEs: a literature review. *Journal of*
10 *Knowledge Management*, 16(6), 879-903.
- 11 Durst, S., & Wilhelm, S. (2012). Knowledge management and succession planning in SMEs. *Journal of*
12 *Knowledge Management*, 16(4), 637-649.
- 13 Dutta, D. K., & Crossan, M. M. (2005). The nature of entrepreneurial opportunities: understanding the
14 process using the 4I organizational learning framework. *Entrepreneurship Theory and Practice*, 29(4),
15 425-449.
- 16 Dyer, W. G. and Wilkins, A. L. (1991), "Better stories, not better constructs, to generate better theory: A
17 rejoinder to Eisenhardt", *Academy of Management Review*, Vol 16 No 3, pp. 613-619.
- 18 Garcia-Morales, V. J., Ruiz Moreno, A., & Llorens-Montes, F. J. (2006). Strategic capabilities and their effects
19 on performance: entrepreneurial, learning, innovator and problematic SMEs. *International Journal of*
20 *Management and Enterprise Development*, 3(3), 191-211.
- 21 Gray, C., & Gonsalves, E. (2002). Organizational learning and entrepreneurial strategy. *The International*
22 *Journal of Entrepreneurship and Innovation*, 3(1), 27-33.
- 23 Greene, P.G., 1997. A resource-based approach to ethnic business sponsorship: a consideration of Ismaili-
24 Pakistani immigrants. *Journal of Small Business Management* 35 (4), 58-71.
- 25 Hsu, D. H. (2006). Venture capitalists and cooperative start-up commercialization strategy. *Management*
26 *Science*, 52(2), 204-219.
- 27 Jo, H. and Lee, J., 1996. The relationship between an entrepreneur's background and performance in a new
28 venture. *Technovation* 16 (4), 161-171.
- 29 Kakati, M., 2003. Success criteria in high-tech new ventures. *Technovation* 23 (5), 447-457.
- 30 Kolb, D. A., Boyatzis, R. E., & Mainemelis, C. (2001). Experiential learning theory: Previous research and new
31 directions. *Perspectives on thinking, learning, and cognitive styles*, 1(2001), 227-247.
- 32 Kolvereid, L., & Isaksen, E. (2006). New business start-up and subsequent entry into self-
33 employment. *Journal of Business Venturing*, 21(6), 866-885.
- 34 Kuivalainen, O., Saarenketo, S., & Puumalainen, K. (2012). Start-up patterns of internationalization: A
35 framework and its application in the context of knowledge-intensive SMEs. *European Management*
36 *Journal*, 30(4), 372-385.
- 37 Leach, T., Kenny, B., 2000. The role of professional development in simulating change in small growing
38 businesses. *Continuing Professional Development* 3 (1), 7-22.
- 39 Lechner, C., Dowling, M., 2003. Firm networks: external relationships as sources for the growth and
40 competitiveness of entrepreneurial firms. *Entrepreneurship and Regional Development* 15 (1), 1-26.
- 41 Lee, R., & Jones, O. (2008). Networks, communication and learning during business start-up: the creation of
42 cognitive social capital. *International Small Business Journal*, 26(5), 559-594.
- 43 Lefebvre, É., Lefebvre, L. A., & Roy, M. J. (1995). Technological penetration and organizational learning in
44 SMEs: the cumulative effect. *Technovation*, 15(8), 511-522.
- 45 Liao, J., Welsch, H., & Stoica, M. (2003). Organizational absorptive capacity and responsiveness: an
46 empirical investigation of growth-oriented SMEs. *Entrepreneurship Theory and Practice*, 28(1), 63-85.
- 47 Lichtenstein, B.M.B., Brush, C.G., 2001. How do "resource bundles" develop and change in new ventures? A
48 dynamic model and longitudinal exploration. *Entrepreneurship: Theory and Practice* 25 (3), 37-59.
- 49 Liyanage, C., Elhag, T., Ballal, T., & Li, Q. (2009). Knowledge communication and translation—a knowledge
50 transfer model. *Journal of Knowledge management*, 13(3), 118-131.
- 51 Macpherson, A., & Holt, R. (2007). Knowledge, learning and small firm growth: A systematic review of the
52 evidence. *Research Policy*, 36(2), 172-192.
- 53
54
55
56
57
58
59
60

- 1
2
3 Man, T. W., Lau, T., & Chan, K. F. (2002). The competitiveness of small and medium enterprises: A
4 conceptualization with focus on entrepreneurial competencies. *Journal of Business Venturing*, 17(2),
5 123-142.
- 6 Massaro, M., Handley, K., Bagnoli, C., Dumay, J. (2016). Knowledge management in small and medium
7 enterprises: a structured literature review. *Journal of Knowledge Management*, 20(2), 258-291.
- 8 Midler, C., & Silberzahn, P. (2008). Managing robust development process for high-tech startups through
9 multi-project learning: The case of two European start-ups. *International Journal of Project*
10 *Management*, 26(5), 479-486.
- 11 Nonaka, I. (1991). *Models of knowledge management in the West and Japan*.
- 12 Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the*
13 *dynamics of innovation*. Oxford University Press.
- 14 Nonaka, I., & Toyama, R. (2003). The knowledge-creating theory revisited: knowledge creation as a
15 synthesizing process. *Knowledge Management Research & Practice*, 1(1), 2-10.
- 16 Olson, P.D., Bokor, D.W., 1995. Strategy process-content interaction: effects on growth performance in
17 small, start-up firms. *Journal of Small Business Management* 33 (1), 34-44.
- 18 Paulin, D., & Suneson, K. (2012). Knowledge transfer, knowledge sharing and knowledge barriers—three
19 blurry terms in KM. *The Electronic Journal of Knowledge Management*, 10(1), 81-91.
- 20 Penrose, E.T. (1959). *The Theory of the Growth of the Firm*. London. Basil Blackwell, Oxford.
- 21 Perren, L., & Grant, P. (2000). The evolution of management accounting routines in small businesses: a
22 social construction perspective. *Management Accounting Research*, 11(4), 391-411. Politis, D. (2005).
23 The process of entrepreneurial learning: A conceptual framework. *Entrepreneurship Theory and*
24 *Practice*, 29(4), 399-424.
- 25 Rae, D. (2005), "Entrepreneurial learning: a narrative-based conceptual model", *Journal of Small Business*
26 *and Enterprise Development*, Vol. 12 No. 3, pp. 323-335.
- 27 Sadler-Smith, E., Spicer, D. P., & Chaston, I. (2001). Learning orientations and growth in smaller firms. *Long*
28 *Range Planning*, 34(2), 139-158.
- 29 Spender, J.C., (1989). *Industry recipes: the nature and source of management judgement*. Basil Blackwell,
30 Oxford.
- 31 Stake, R. (2000), "Case studies", in N. K. Denzin and Y. S. Lincoln (Eds), *Handbook of Qualitative Research*,
32 Thousand Oaks, Sage Publications, Inc, United States of America, pp. 435-454.
- 33 Szulanski, G. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational*
34 *Behavior and Human Decision Processes*, 82(1), 9-27.
- 35 Tangaraja, G., Mohd Rasdi, R., Ismail, M., & Abu Samah, B. (2015). Fostering knowledge sharing behaviour
36 among public sector managers: a proposed model for the Malaysian public service. *Journal of*
37 *Knowledge Management*, 19(1), 121-140.
- 38 Trequattrini, R., Shams, R., Lardo, A., & Lombardi, R. (2016). Risk of an epidemic impact when adopting the
39 internet of things: The role of sector-based resistance. *Business Process Management Journal*, 22(2),
40 403-419.
- 41 Van Gelderen, M., Van de Sluis, L., & Jansen, P. (2005). Learning opportunities and learning behaviours of
42 small business starters: relations with goal achievement, skill development and satisfaction. *Small*
43 *Business Economics*, 25(1), 97-108.
- 44 Wee, C.N.J., Chua, A.Y.K. (2013). The peculiarities of knowledge management processes in SMEs: the case
45 of Singapore. *Journal of Knowledge Management*, 17(6), 958-972.
- 46 Welschen, J., Todorova, N., & Mills, A. M. (2012). An investigation of the impact of intrinsic motivation on
47 organizational knowledge sharing. *International Journal of Knowledge Management (IJKM)*, 8(2), 23-
48 42.
- 49 Wu, L. Y. (2007). Entrepreneurial resources, dynamic capabilities and start-up performance of Taiwan's
50 high-tech firms. *Journal of Business Research*, 60(5), 549-555.
- 51 Wong, Y. K., & Aspinwall, E. (2004). Characterizing knowledge management in the small business
52 environment. *Journal of Knowledge management*, 8(3), 44-61.
- 53 Yin, R. K. (2014), *Case Study Research: Design and Methods*, SAGE, Los Angeles.
- 54
55
56
57
58
59
60

1
2
3 Yli-Renko, H., Autio, E., & Sapienza, H. J. (2001). Social capital, knowledge acquisition, and knowledge
4 exploitation in young technology-based firms. *Strategic Management Journal*, 22(6-7), 587-613.

5 Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and
6 extension. *Academy of Management Review*, 27(2), 185-203.

7 Zhang, M., Macpherson, A., & Jones, O. (2006). Conceptualizing the learning process in SMEs: improving
8 innovation through external orientation. *International Small Business Journal*, 24(3), 299-323.
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table I – Validation of the results

Test	Strategy	Phase
Construct validity	Multiple data sources	Data collection
	Validation of the construction through the key components of the organisation	Design of the study Construction of the findings
	Adoption of a KT framework (Liyanage et al., 2009)	Design of the study Construction of the findings
Internal validity	The case presents characteristics that justify the internal validity of the results	Selection of the case
External validity	Validation with external references	Construction of the findings

Table II - External validation strategy

Issues	Liyanage et al. framework (2009)	External references	Sources
Role of the entrepreneur in the KT process	Awareness of the relevant knowledge and absorptive capacity of the entrepreneur based on market and strategy orientation	Market orientation and learning (Baker & Sinukula, 1999)	FN1
		Passion for founding (Breugst et al., 2012)	FN2
	Application of useful knowledge in different contexts		IS1
		Selecting the absorptive capacity of receivers	
Change of KT during the development phase	Performance measurement	Knowledge and small firm growth (Macpherson and Holt, 2007)	IS5
	Networking activity		IS2
		Organisational learning (Dutta and Crossan, 2005)	IS6

Table III: Sources of the collected case study data

Details	Company	Date	Reference
Informal meeting field notes			
Matteo Minelli	Eco-Suntek/Birra Flea	1 Sep 2016	FN1
Master Brewer and factory visit	Birra Flea	27 Jan 2017	FN2
Matteo Minelli and staff	Birra Flea	13 Feb 2017	FN3
Semi-structured interviews			
Matteo Minelli	Eco-Suntek/Birra Flea	9 Mar 2017	IS1
Commercial Manager	Birra Flea	16 Mar 2017	IS2
Master Brewer and Director of Production	Birra Flea	16 Mar 2017	IS3
Administrative Executive	Birra Flea	16 Mar 2017	IS4
External Consultant / Associate	Sua Sum Business Advisory	17 Mar 2017	IS5
External Controller	KPMG Consulting	27 Mar 2017	IS6
Master Brewer and Director of Production	Birra Flea	16 May 2017	IS7
Internal documents			
Financial statements	Birra Flea	2013-2016	IDs 1-4
Start-up business plan	Birra Flea	2013-2016	ID5
Product costing report forms	Birra Flea	16 Mar 2017	IDs 6-7
Website and media releases			
Official company website	Birra Flea	01 Sep 2016	WM1
Bianca Lancia Award I°Classified –	UnionBirrai	26 Feb 2016	WM2
Noel Award I° Classified –	UnionBirrai	26 Feb 2016	WM3
Beer experts website	untappd.com	9 Mar 2017	WM4
Beer experts forum on Facebook)	analfabeti della birra	9 Mar 2017	WM5
Beer experts website (untappd.com)	www.cronachedibirra.it	9 Mar 2017	WM6
“China Beer Award” media release	Independent Experts from China, Hong Kong, and Taiwan	28 Dec 2016	WM7

Table IV: The process of transferring knowledge from external sources to the entrepreneur

1. Key knowledge	Planning and control knowledge	Product knowledge	Market knowledge
2. Key sources	Consultant (ID5)	Brewer (ID3)	Web/public knowledge
3. Transfer steps:			
Awareness	Entrepreneur's need to plan investments and cash flow returns (IS1; IS5; IS6)	Need to rely on the best expertise available for the production process of craft beer (IS1; IS3; FN2)	Strategic orientation for positioning the product in a segment not present in the craft beer market (IS1; IS2)
Acquisition	Collaboration in previous business experience with the stock exchange listing process (FN1; IS1; IS5)	Six months of collaboration before setting up the brewery (IS1; IS3; FN2)	Individual study of blogs, and competitor forums (IS1; WM4-6)
Transformation	Adapting planning competencies from a listed company to a start-up (IS5; IS6)	Identifying the objectives to be achieved in terms of taste varieties (FN3; IS3)	Finding a gap in craft beer products with the most appropriate taste and prices for the market (IS1; IS3)
Association	n/a	n/a	Evaluation of recipes from the perspective of market gaps (IS1; IS2)
Application	Developing a detailed business plan for the brewery (IS5; IS6; ID5)	Experimenting with four basic recipes in a small laboratory (IS1; IS3)	Testing the recipes with potential customers (FN1; FN2; IS1; IS3)
Externalisation	Presentation of the business plan to external partners (IS1; IS5; IS6)	Defining the explicit protocols of four main recipes and internal tests (IS1; IS3)	Elaboration of a "Flea-style" value proposition to be communicated to customers (IS2)
4. Other elements:			
Form of transfer	From the tacit to the explicit (externalisation) (FN1; FN2; IS5)	From the tacit to the explicit (externalisation) (FN2; IS1; IS3)	From the explicit to the tacit (internalisation) (IS1; IS2)
Performance measurement	Ability to understand and apply planning and control mechanisms (IS4; IS6)	The four recipes initially developed are still the foundation of Flea's value proposition (IS1; IS2; IS3)	Feedback from the first customers on the pre-launch tasting samples (FN2; FN3; IS1; IS2)
Influence factors	Passion, open-mindedness, courage, humility, and growth-oriented entrepreneurship (IS1; IS5)	Developing industrial production with a good margin and an adequate variety of flavours (IS1; IS2)	Meeting the tastes of consumers and making a beer that will have wide appeal among consumers (IS2; IS7; WM3; WM7)

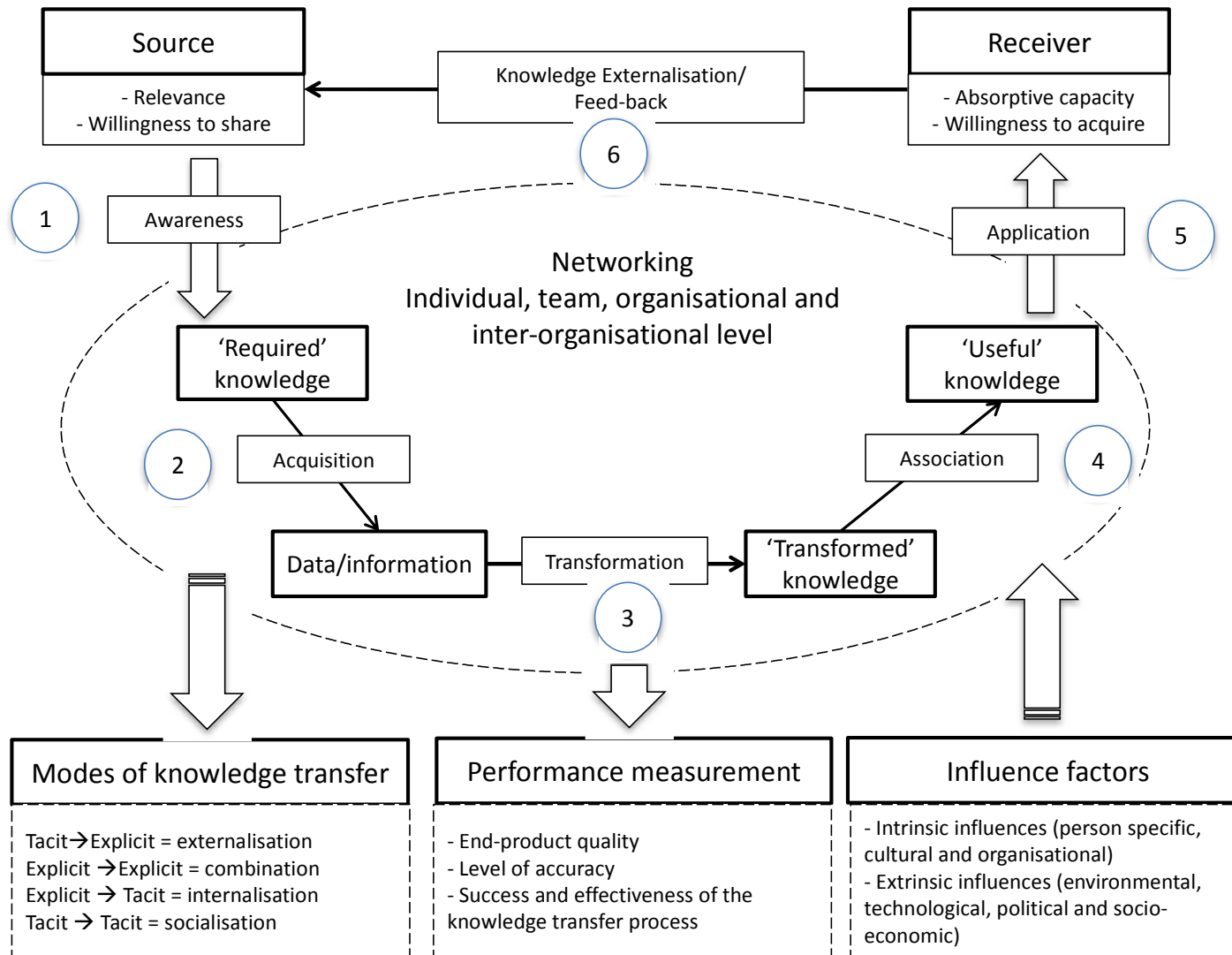
Table V: The process of transferring knowledge from the entrepreneur into business practices

1. Key knowledge	Accounting and reporting knowledge	Production process knowledge	Marketing and commercial knowledge
2. Key receiver	Administrative manager	Brewer	Commercial manager
3. Transfer steps			
Awareness	Entrepreneurial need for structured controls (IS1; IS4; IS6)	Plans for incremental growth of production capacity (IS1; IS3; IS7)	Market development for return on investment (IS1; IS2)
Acquisition	Previous acquired competences and motivation for professional growth (IS1; IS4)	Previous expertise and new organisational solutions to be analysed and implemented (IS1; IS3; IS7)	Relational skills and entrepreneurial coaching in commercial activities (IS1; IS2)
Transformation	Adapting competencies acquired in a multinational company to business processes for a start-up (IS4; IS5)	n/a	Managing the scouting, research, and relationships of customers (IS2)
Association	Cross-functional interactions with production and commercial processes (IS2; IS3; IS4)	n/a	Cross-functional interactions with production and administrative processes (IS2; IS3; IS4)
Application	Preparation of administrative and financial control reports (IS4; ID6-7)	Design of plant production processes (IS3; IS7)	Building a value proposition consistent with Flea's style (IS1; IS2; IS3)
Externalisation	Structured reporting to the entrepreneur (IS4; IS6; ID6-7)	Effective design for the successful growth of production capacity (IS3)	Partial ability to manage customers autonomously (IS1; IS2)
4. Other elements			
Form of transfer	From the tacit to the explicit (externalisation) (IS4; ID6-7)	From the tacit to the explicit (externalisation) (IS1; IS3)	From the tacit to the tacit for the affiliation of customers (socialisation) (IS1; IS2) Non-transferable commercial knowledge for managing strategic business development (IS2)
Performance measurement	Ability to understand and apply the accounting and control mechanisms required by a listed company (IS4; IS5)	Possibility to gradually increase production capacity (IS1; IS3)	Development of a 2000-customer commercial network (IS2)
Influence factors	Opportunity for professional growth, entrepreneurial control (IS1; IS4)	Grow the size of the business and build an organisation independent of Minelli's daily presence (IS1; IS3; IS7)	The will to create Flea's style and a strong orientation toward customer's tastes (IS1; IS2)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

Figure 1: Knowledge transfer: a process model:

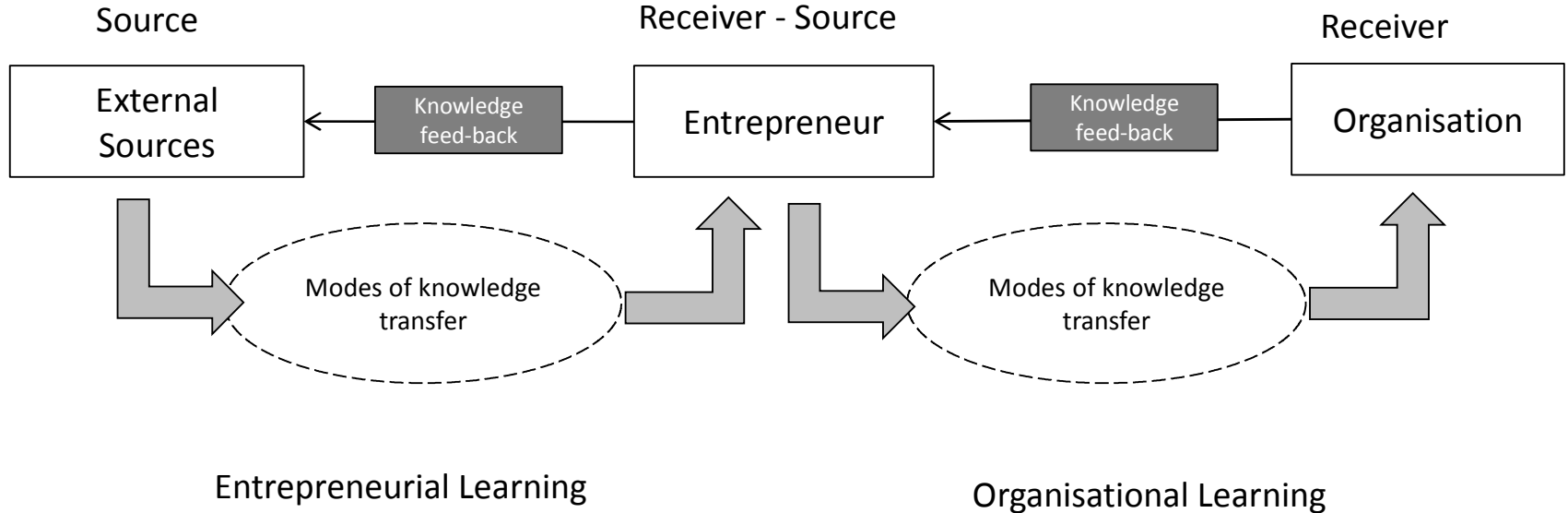




Source: adapted from Liyanage et al., 2009.

Journal

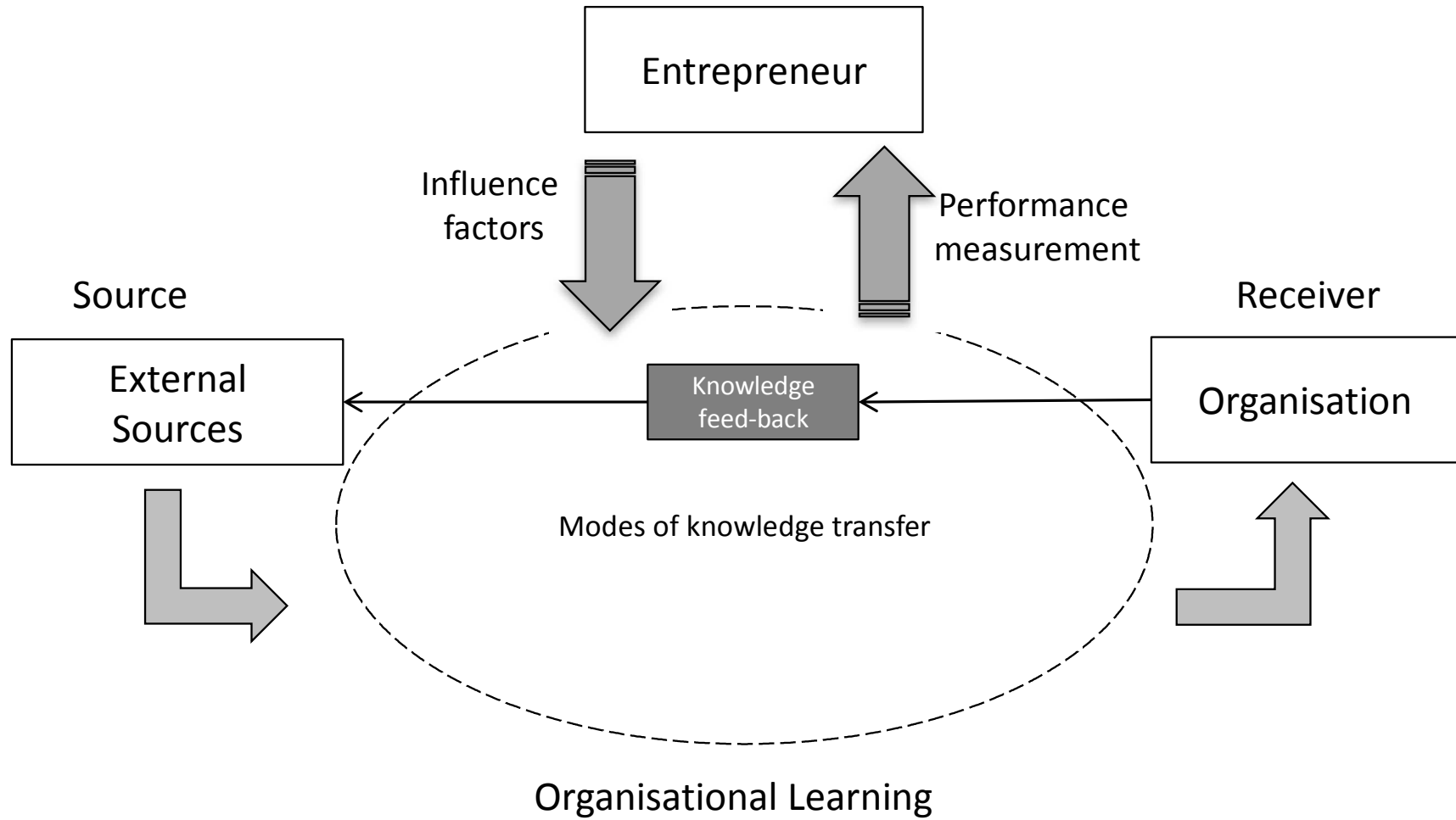
Figure 2 – KT during the start-up phase



Management Journal

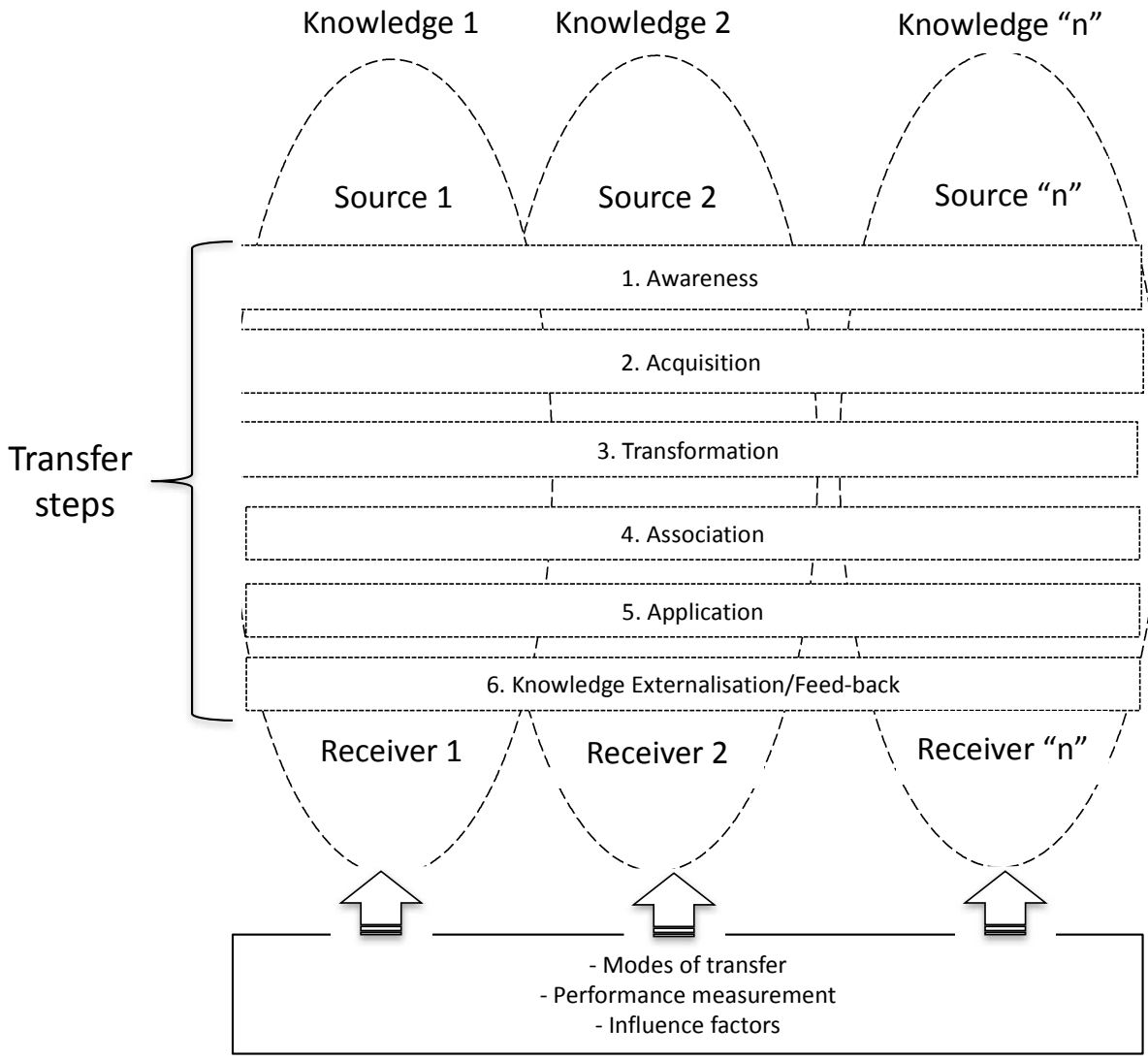
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

Figure 3 – The KT process during the development phase



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

Figure 4 – Mutual influence of the KT steps of the Liyanage et al. (2009) framework



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

ment Journal