

4. Entrepreneurial opportunity identification: the case of Skype Technologies

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INTRODUCTION

The ability of entrepreneurs to identify opportunities and develop new ventures intrigues researchers from the very beginning of entrepreneurship as a scientific discipline (Kirzner, 1979; Schumpeter, 1934). The rapid technological development during the late 1990s triggered an especially intriguing period in entrepreneurial history as prevailing investor optimism fuelled the growth of internet ventures at an unprecedented pace. The bursting of the Internet stock market bubble in March 2000 grounded the high-flying dreams of new economy ventures based on Internet technologies. However, the following period of prevailing investor pessimism and maturing technologies was the breeding ground for some of the fastest-growing entrepreneurial ventures in history.

One of such companies was Skype, founded in 2002 by Niklas Zennström and Janus Friis. The company offered an alternative to traditional telephones by offering a free service that enabled Internet users to use their computers for voice communication. The first version of the software was released in August 2003. Up until October 2005 the service attracted 54 million users and it was sold to EBay for \$2.6 billion. By the time it was sold the total amount of money invested in the company was \$20 million, making it one of the fastest growing start-ups in history (Gruber, 2006).

Such rapid entrepreneurial growth opens several 'Why?' and 'How?' questions connected to the opportunity, the entrepreneurs and the venture itself, and offers a unique and interesting research case for the study of the entrepreneurial process. We focus the study on the opportunity identification and development of the venture.

The chapter proceeds as follows: first we review the existing literature on entrepreneurial opportunities, focusing on the opportunity identification and creation. This is followed by a case study of Skype Technologies. We

focus mostly on the period before the venture was created, analysing the development of technologies that enabled the creation of the venture and the role the entrepreneurs played in the identification and creation of the opportunity. The case data is used to develop a grounded model of opportunity identification for the venture. In the final part we apply the theory on opportunity identification and development on the model to propose a more general model for further testing and analysis.

ENTREPRENEURIAL OPPORTUNITIES

The study of entrepreneurial opportunities is in the nexus of entrepreneurship research (Ardichvili et al., 2003; Busenitz et al., 2003; Eckhardt and Shane, 2003; Shane, 2000; Shane and Venkataraman, 2000). The study of favourable junctures of circumstances¹ that enable the emergence of new ventures, products and services and their role in the entrepreneurial process are among the traditional and still current topics in entrepreneurship research (for example Kirzner, 1979; Shane and Venkataraman, 2000; Ardichvili et al., 2003; McMullen et al., 2007; Ucbasaran et al., 2009). Without opportunities there is no entrepreneurship, yet there is an ongoing debate within the entrepreneurship literature on issues such as the source, scope and objectivity of entrepreneurial opportunities (Shane and Venkataraman, 2000; Ardichvili et al., 2003; McMullen et al., 2007; Dimov, 2007a; Sarasvathy, 2001; Nicolaou and Shane, 2009; Davidsson, 2008).

The vast body of research on entrepreneurial opportunities can be roughly divided into two distinct ontological streams. The traditional positivist view assumes that opportunities exist in the environment independently of the entrepreneur. They are objective phenomena in the environment, yet the process of opportunity discovery is a subjective process (Shane and Venkataraman, 2000). Different people will discover different opportunities based mostly on their previous experience and beliefs. Given that an asymmetry of beliefs is a precondition for the existence of entrepreneurial opportunities, all opportunities must not be obvious to everyone all of the time. People must not agree on the value of resources at a given point in time. Entrepreneurs find new ways of using available resources to produce more valuable outcomes (Eckhardt and Shane, 2003). The approach assumes that market imperfections exist in the environment and that the entrepreneurs play a passive and responsive role (Alvarez and Barney, 2005). Entrepreneurs are only proactive when they exploit the opportunity (Eckhardt and Shane, 2003). The process of the discovery of objective opportunities is normally treated as the process of opportunity recognition and is the prevailing view in the entrepreneurship literature.

Alternatively a more recent stream of research (for example Ardichvili et al., 2003; Dimov, 2007b; Dutta and Crossan, 2005; Sarasvathy, 2004; Vaghely and Julien, 2010) argues that the entrepreneurs play a central role in the creation of an entrepreneurial opportunity. Entrepreneurs do not discover opportunities; rather, they create them by taking advantage of technological change or innovation occurring in the economy. The opportunities arise as an outcome of the new conditions on the market created by the innovating 'entrepreneur-hero' (Dutta and Crossan, 2005).

Also the mere discovery of opportunities is not enough to ensure a viable venture, and the entrepreneurs play a key role in the development of the opportunity (Ardichvili et al., 2003; Dimov, 2007b; Sarasvathy, 2004).

Sarasvathy (2004) proposes that what are discovered are not opportunities yet merely possibilities that have to be developed to become opportunities. In a similar manner Ardichvili et al. (2003) suggest that the process of opportunity recognition should be studied in two phases: (1) identification and (2) development. The way an opportunity is developed is strongly connected to the individual which means that two different entrepreneurs would not develop the same opportunity in the same way (Dimov, 2007a).

However, not only does the individual play an important role in the development phase, but also their role is very important in the identification phase. According to the positivist view, which assumes that opportunities exist independently of the entrepreneurs, the question concerning whether an entrepreneur will discover and pursue an opportunity is the question of entrepreneurial alertness to specific ideas, which is a result of previous experience, an interpretative framework and past knowledge (Yu, 2001; Kirzner, 1997). Constructionists emphasize the role of the individual even more by treating the entrepreneur and his/her actions as a necessary condition for the creation of an opportunity (Dimov, 2007a). Some elements of opportunities may be recognized; opportunities in general are made, not found.

What both approaches have in common is the moment (or process) of recognition or identification of the opportunity.² Following the positivistic ontology, the opportunities recognized also consist of scripts and actions that need to be taken in order to develop the opportunities into successful ventures, while the identification approach treats the identified opportunities as subjective perceptions of what the entrepreneurs believe (Dimov, 2007a) could be possibilities (Sarasvathy, 2004) for the development of successful ventures. The moment when an entrepreneur becomes aware of an opportunity is treated as 'insight'. During insight, the individual has a breakthrough, 'Aha!' moment. Corbett (2005) suggests that during insight a cognitive shift takes place as the individual begins to consciously realize that he/she may have identified an opportunity to break an existing

means–end relationship. In broadest terms, a person's business idea constitutes a mental image of a particular group of customers benefiting from using a particular product or service (Sarasvathy, 2004). It can be either convergent, by making sense of apparently disconnected facts, or divergent, by generating possibilities that others would not consider (Dimov, 2007a). The insights can happen as a result of a causation process or an effectuation process (Sarasvathy, 2001); however, in most cases entrepreneurs employ both at different times (Vaghely and Julien, 2010).

Opportunity identification and development is a process through which the entrepreneurs massage, develop and alter the opportunity. The opportunity takes many forms, from a mere identified possibility through business concepts and business models until it is developed and tested enough to be ready for commercial exploitation (Ardichvili et al., 2003). The literature makes a notable distinction between the identification and development phase of the entrepreneurship process; however, less is clear when it comes to the questions regarding what the result of both phases is and where the process of identification ends and development starts.

METHODOLOGY

To study the opportunity identification phase of the entrepreneurial process further we turn to the studied phenomenon itself. We embrace a grounded theory building approach to study with the purpose of exploratory richness (Bygrave, 2006). We ground our research in rich data gathered on Skype Technologies.

Grounded theory methods consist of systematic, yet flexible guidelines for collecting and analysing qualitative data to construct theories grounded in the data themselves (Charmaz, 2006). The method was conceived by Glaser and Strauss (1967) who conveyed a discontent with the dominant logico-deductive approach to research practices of their time. They introduced a grounded systematic approach to data analysis that leads to inductive discovery of theory. We define grounded theory as theory derived from data that has been systematically collected and analysed using an iterative process of considering and comparing earlier literature, its data and the emerging theory (Mäkelä and Turcan, 2006).

The study uses secondary data in forms of written interviews, video interviews, presentations and Internet news feeds. The ample media attention received by the studied company made it possible to build a reliable chain of events supported by rich data. A qualitative data analysis software, Atlas.ti, is used to organize and code the studied data. The software is also used to organize codes and form categories and concepts keeping

the links to the raw data to enable double checks. Data triangulation (as suggested by Yin, 2003) is used to verify key events and concepts.

Identified categories are organized in a network to build a grounded case-specific model of opportunity identification. We attempt to generalize the categories in the model by testing the discovered relationships and concepts with established theory and identifying potential building blocks of a more general theory.

As always with inductive research designs based on single case studies, the question of applying the finding to a more general level of theory is questionable, as the nature of the method demands subjective inferences and interpretations not present with quantitative methods. Those negative aspects of the methodology employed can be improved by employing the same level of rigidity as with quantitative methodologies when collecting and analysing the data; however, complete objectivity can never be achieved. While being fully aware of the limitations, we followed the call of several established scholars in entrepreneurship research (for example Davidsson, 2008; Bygrave, 2006 and Hindle, 2004) to employ more exploratory qualitative research designs in entrepreneurship aimed at the collection of rich data and a deeper understanding of the intriguing entrepreneurship process and development of new grounded theoretical concepts.

Having said that, we are fully aware of the limitations for generalization of the findings of the study. The identified concepts should be further tested and explored to become building blocks of a more general theory.

OPPORTUNITY IDENTIFICATION: THE CASE OF SKYPE TECHNOLOGIES

When asked about the key factors that made the rise of Skype possible, Niklas Zennström responds: ‘a lot of things are of course timing and luck’ (Q1, Q2).³ We start by first studying the favourable developments of technologies and markets that made the timing right for the start of the venture.

Voice over the Internet Protocol: VoIP

The entrepreneurs chose to start their venture in the telephony market that was ‘characterized both by what we think is rip-off pricing and a reliance on heavily centralized infrastructure’ (Q3). The heavily centralized infrastructure resulted in high levels of needed capital investments with high economies of scale leading to natural monopolies, which resulted in strict

government regulation of the telecommunications market. The entrepreneurs saw a possible alternative in the Internet infrastructure 'any digital content should be delivered over the Internet because it's so much more efficient' (Q4). In addition to bringing a lower cost of telecommunication by using the Internet infrastructure, the technology makes it possible to add advanced digital features to telephony as well as device and location independence (Wikipedia, 2008a).

However, the idea of using the Internet for voice communication was not one first discovered by the entrepreneurs. The first successful VoIP transmission was tested in 1974 on ARPAnet, which was the basis for the modern Internet. Rapid development and commercialization of the technology started in 1996 when visionary companies such as Vocaltec, Netspeak and Net2Phone (Aguilar, 1996) were trying to tackle the technological barriers and develop viable business models. VoIP received ample attention during the late 1990s with several companies, even such as Yahoo (in 1998), Netscape (in 1999) and Microsoft (in 2001), trying to benefit from the huge potential of the technology with little success. By 2000 VoIP was to some extent commercialized with services offering cheaper international calls (IBT, 2000) and slowly DSL (digital subscriber line) and cable television providers were starting to offer telephony as an addition to their regular services (Bygrave, 2006). While slowly attracting new users, companies failed to lower the cost of services significantly, with cost savings of merely 10 per cent as a lot of expensive equipment still had to be purchased with every new user (Aguilar, 1996).

After years of over-promising and underperforming, in 2002 the technology seemed mature enough; however, a clear market leader could not easily be identified and no major disruption happened on the telecommunications market. Viable business models were built around selling calling cards that made it possible to make cheaper telephone calls, and cable and broadband operators were offering flat rate VoIP telephone calls as a part of their service. There were still few cost advantages as they had to invest in the infrastructure and connected equipment. Several instant messaging services (such as MSN, Yahoo Messenger) also had voice chat, but failed to leverage it to be a profitable business and to technologically solve the problem of high server loads connected with the service. The existing software also had problems with firewalls that made the installation of VoIP software complicated, and the existing solutions were user unfriendly, demanding advanced computer knowledge. Also institutional black clouds were gathering to block the development of the technology as it presented a serious risk to the lucrative telecommunication business.

This was seen by the entrepreneurs: 'I remember us saying (around 2002) that Internet telephony should work by now. We certainly didn't

invent Internet telephony, but it wasn't very good and was too hard to use' (Q6). 'The time is right to take on Internet telephony. Broadband penetration is high enough, and people are ready for it; it's been an unfulfilled promise for years' (Q7).

Broadband Internet

In the early years of the Internet most people accessed it using a modem on a traditional telephone line. This was slow, with speeds hardly fast enough to deliver text messages and basic pictures; it was also inconvenient as it blocked the whole telephone line. Also the payment was based on a pay-per-minute system, which made the use of the Internet very costly.

Broadband access has many advantages over dial-up, the most notable being a fixed fee for accessing the Internet regardless of the time spent on-line. In addition to that, high transfer speeds enable users to exchange types of data that are bigger, such as images, video and audio. In 2006 the OECD treated an Internet connection as broadband if its speed exceeded 256 kbit/s (OECD, 2006); in 2008 the US FCC increased that speed to 768 kbit/s (Wikipedia, 2008b). The term 'broadband' does not define the technology used to achieve the above-mentioned speeds. Most common are: ISDN, DSL, cable internet, fibre optics to the end user and so on. In this research we focus on the development of broadband access up to the year 2003 when Skype Technologies was founded.

An analog modem that converted digital signals was developed to the point where it could transfer up to 56kbit/s in the late 1990s (Wikipedia, 2008c). Using a modem to access the Internet was costly, slow, unreliable and time-consuming. After some tries with the ISDN technology, ADSL, Asymmetric Digital Subscriber Line, was developed to provide faster access. The technology was first designed to make it possible to provide video on demand, yet when these high-flying dreams faded away it was repacked to provide high-speed Internet access (Marples, 2004). The main benefit of the technology was that it used the existing copper wire cables used by telephones to transmit a much greater volume of data to the end user and at the same time enabled the use of telephones while surfing the Internet (Wikipedia, 2008g). Another boost came with the passage of the Telecommunications Reform Act of 1996, which allows local phone companies, long-distance carriers, cable companies, radio/television broadcasters, Internet/online service providers, and telecommunications equipment manufacturers in the United States to compete in one another's markets. The race to provide broadband bandwidth was on.

The start of commercial ADSL was in late 1997 with a more aggressive market entry in 1998 (Emory, 2008). By the end of 2001 the penetration

of broadband Internet access was fairly small. According to OECD (2008) the broadband penetration in the USA was 4.3 per cent, just 2.2 per cent in Japan and a mere 1.6 per cent in the EU. The figure grew sharply until at the end of 2003 there was a penetration of 10.9 per cent in the USA, 5.9 per cent in the EU and 10.7 per cent in Japan. The majority of the penetration growth can be attributed to the DSL technology, as in 2007 it accounted for 62 per cent of broadband Internet access (OECD, 2008). The volume of data transmitted over the Internet in the period has grown more than 100 times in the period from 1996 to 2003 (Minnesota Internet Traffic Studies, 2008).

The rapid increase in Internet connection capabilities and the flat rate billing system that enabled internet users to stay connected and transfer data from the internet even when they were not using the computer made a strong impact on the way people were using the Internet. The era of using the Internet to transmit mostly text messages was over. 'With our work at Kazaa, we began seeing growing broadband connections and more powerful computers and more streaming multimedia, and we saw that the traditional way of communicating by phone no longer made a lot of sense' (Q5).

The first data format to flourish with Internet exchange was audio. MP3 codec, used to compress audio files, was developed in 1991 by the Fraunhofer Institute; this greatly decreased the size of audio files while maintaining the quality at a high level. It became highly popular with the launch of the Winamp software in 1997 (Wikipedia, 2008h). With the growing popularity of the MP3 format, the need to exchange large files easily over the Internet was greater than ever. Yet the traditional server-client infrastructure internet couldn't be applied for the needs of file exchange as it presented great hardware server requirements as well as presenting severe legal issues. The answer to the challenge was the development of peer-to-peer networks.

Peer-to-Peer Networks

A peer-to-peer (or 'P2P') computer network uses diverse connectivity between participants in a network and the cumulative bandwidth of network participants rather than conventional centralized resources where a relatively low number of servers provide the core value to a service or application (Wikipedia, 2008i).

P2P is a widely used and abused term. Software is not peer-to-peer just because it establishes direct connections between two users; most Internet software does this to some extent. True P2P software creates a network

through which all clients join together dynamically to help each other route traffic and store information. The power of the network grows with the number of users (Q8).

The core concept of the Internet is designed in a peer-to-peer architecture, yet bandwidth problems and the processing power of personal computers dictated a more server-based structure in the early years. Yet with the increased availability of broadband Internet, the capabilities of the limited servers became the one of the key problem for exchanging files between Internet users. One of the first major companies to tackle the problem was Napster, which operated between June 1999 and July 2001 (BusinessWeek, 2000). The software enabled Internet users to share music files, using a combination of server and peer-to-peer technology. It was an instant hit, peaking at 26.4 million global users in early 2001 (Wikipedia, 2008f). The service was heavily sued for its role in the illegal distribution of copyrighted material (Lefevre, 2000). As a result it was finally shut down in July 2001 (Wikipedia, 2008f).

The legal problems Napster had and the limitations on the transfers left millions of Internet users wanting to continue to download free music from the Internet, looking for a substitute service. The lack of a way to share files through the Internet was seen by Niklas Zennström and Janus Friis.

Niklas Zennström and Janus Friis

Niklas was born in Sweden in 1966. He has a dual degree in Business Administration (BSc) and Engineering Physics (MSc) from Uppsala University in Sweden. He spent his final year at the University of Michigan, Ann Arbor, USA (Wikipedia, 2008d). He started his professional career in one of the biggest European telecommunication operators, Tele2. There he worked on a project for launching a Danish ISP provider, get2net, and managed a web portal called www.everyday.com. At Tele2 he met *Janus Friis* (Gruber, 2006). Janus was born in 1976 and has no formal education. He left school during his 10th grade to work at a helpdesk at a Danish ISP provider called CyberCity. In 1996 he was hired by Niklas Zennström to run the customer support of Tele2 in Denmark (Gruber, 2006; Wikipedia, 2008e). In 1999 they left Tele2 to start a company that developed a protocol called FastTrack that enabled cheap peer-to-peer transaction over the Internet. The main advantage of the protocol was that it needed no server to run the network as the index of users and files on the network was distributed among the users, which made it the perfect platform for file exchange systems (Gruber, 2006).

Kazaa

In 2000 Janus and Niklas hired a group of three Estonian programmers to develop software that enabled file search and exchange between computers without any central server infrastructure. The development took a mere four months and in July 2000 Kazaa was launched (Tarm, 2003). The platform was perfect for people wanting to exchange music, software and video files after the fall of Napster. The software was an instant hit, with more than 34 million downloads up to October 2001 (Borland, 2001a). This started to attract attention from the big music companies, who started legal action against the company (Borland, 2001b). As a result the company was sold to Sharman Networks, established in Vanuatu in the beginning of 2002 (Yang, 2002). The company was under severe legal pressure; also the business model was based on including adware to the software pack, which made the user's computer work slower, and also other security issues occurred (Borland and Konrad, 2002). After the sale of Kazaa, Niklas and Janus stopped working for the company.

They started a new company called Joltid, which was focused on the development of a technology that made the peer-to-peer networks faster (Olsen, 2003). With a superior knowledge of the new network protocols that enabled an efficient transfer of large files over the Internet without a server infrastructure and extensive entrepreneurial experience from Kazaa, the entrepreneurs searched for new opportunities to put their experience into action. Their time with Kazaa made Janus and Niklas experienced web entrepreneurs with a specific knowledge of peer-to-peer networks and designing and managing viral Internet products.

Opportunity to start Skype

After Kazaa the entrepreneurs were looking for another field where they could put their specific knowledge on P2P technologies into action. 'After Niklas Zennstrom and I did Kazaa, we looked at other areas where we could use our experience and where P2P technology could have a major disruptive impact.' (Q3). When asked about how they identified the opportunity, Zennstrom replies, 'It is about trying to see what are the technical capabilities and what are the consumer trends and try to connect the dots' (Q10) and 'First it is not about crushing industries. It is about creating opportunities. Usually it is like: Why is somebody not doing that? It is not a method. There are discussions. . . the most important thing is the ability to question things' (Q11).

'The telephone is a 100-year-old technology. It's time for a change. Charging for phone calls is something you did last century.' (Q9). The

basis for such a claim from the founder of Skype was grounded in several developments in the telecommunications market in the 1990s. The introduction of the commercial Internet has significantly changed the way in which people live, communicate and do business. One of the most visible changes the Internet brought to the global marketplace was the possibility for the ventures to reach global markets easily. While services like online retail were still limited to certain geographical areas because of the costs of sending goods, companies offering pure online services could access the global market almost without barriers. Marginal cost per each new user added to Internet services were very low, making it possible for entrepreneurs to reach millions and to gain from economies of scale on a completely new level. Despite the Internet bubble burst in 2000 the number of internet users nearly doubled in the period between 2000 and 2002 (Global Village Online, 2008).

In 1996 the USA deregulated its telecommunications market, making it possible for smaller players to compete in the market and to introduce new technologies and services. As described above, the unlimited time broadband Internet was also on the rise, greatly altering the way people used the Internet. With fast and unlimited time access, users spent more time on the Internet, using additional functionalities and new services.

Seeing the market trends and the emerging technologies and infrastructure collide, the entrepreneurs identified the opportunity to start an Internet telephony company 'The time is right to take on Internet telephony. Broadband penetration is high enough, and people are ready for it; it's been an unfulfilled promise for years. P2P technology is really very well suited for Internet telephony, so it is a natural next phase' (Q7). 'People were having more and more broadband connections. If we would have launched Skype three years earlier we wouldn't have taken off as people were using much more dial up connections' (Q2).

The growing broadband Internet penetration was one of the key factors that made the start of the venture possible. However, several others have tried to introduce VoIP services even at the time of the rise of Skype but failed to achieve success: 'all this things have been made but haven't been made good' (Q1). 'We certainly didn't invent Internet telephony, but it wasn't very good and was too hard to use' (Q6). According to the entrepreneurs, Skype addressed the core problems with existing VoIP services, 'bad sound quality, difficult to set up and configure, and the need for expensive, centralized infrastructure. No one has seriously addressed these problems before, and this is why VoIP has never really taken off.' (Q14)

When designing a business model the entrepreneurs followed a 'fre-economics' (Anderson, 2008) design, offering their core service free of charge to the users, therefore attracting users to adopt the service and

invite new users to it. By offering added-value services the entrepreneurs managed to develop a highly profitable business model. *'What we are doing is taking advantage of the broadband Internet to provide basically unlimited free calls to anyone at a higher voice quality than they can with the phone lines'* (Q14). *'We want to make as little money as possible per user. We don't have any cost per user, but we want a lot of them.'* (Q15) Adoption of such a model was possible primarily due to the fact that by using peer-to-peer technology, the company used the infrastructure of their users to act like servers for the network, thus having no cost per user when growing the network.

GROUNDING MODEL OF OPPORTUNITY IDENTIFICATION FOR SKYPE TECHNOLOGIES

During the analysis of the gathered secondary data we did extensive coding of different segments of the text. After analysis we reviewed the codes and merged where the segments coded were similar in meaning. We then identified links between different codes to form a network view on the data as shown in Figure 4.1. During the process the quotations underlying the codes were reread and reorganized. Finally the nodes were grouped using different colours to identify different phases in the opportunity identification process.

Based on the organized codes we further explored and developed the notion proposed by the entrepreneurs that *'it is not about crushing industries. It is about creating opportunities'* (Q11) and *'it is about trying to see what are the technical capabilities and what are the consumer trends and try to connect the dots'* (Q10). As shown in Figure 4.2, opportunities are created to connect the technological development with market trends.

The evolving markets and technologies can be treated as objective external developments that are more or less equally available to all entrepreneurs at a certain given point of time.

However, while technological and market trends represent the *'dots'*, the design of the connection of the dots was strongly influenced by the entrepreneurs. Previous knowledge and experience strongly influenced the way the dots were connected. What is more, the process of looking for an opportunity was to some extent directed by the use of a certain technology and consequently a business model the entrepreneurs wanted to pursue *'after Niklas Zennstrom and I did Kazaa, we looked at other areas where we could use our experience and where P2P technology could have a major disruptive impact'* (Q3). The entrepreneurs were looking for an opportunity where a certain service and business design that they have already

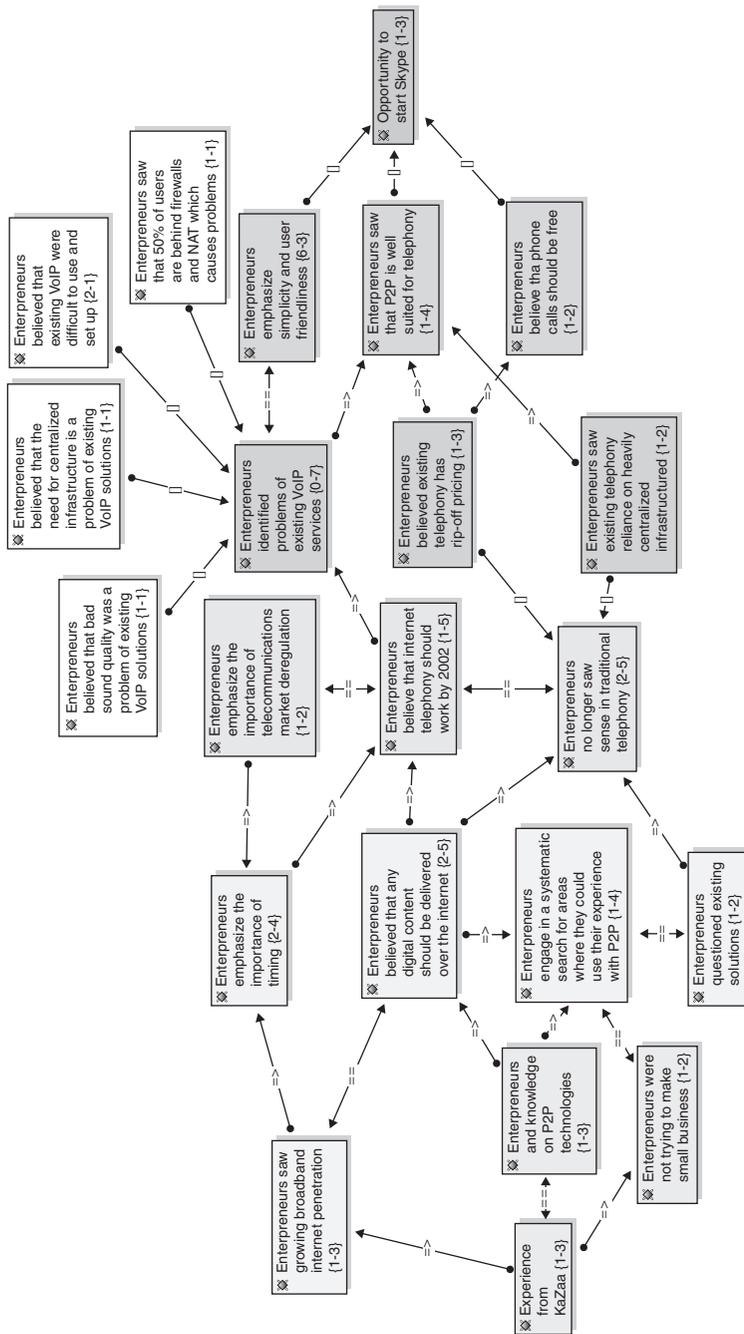


Figure 4.1 Network view on the opportunity identification process for Skype Technologies

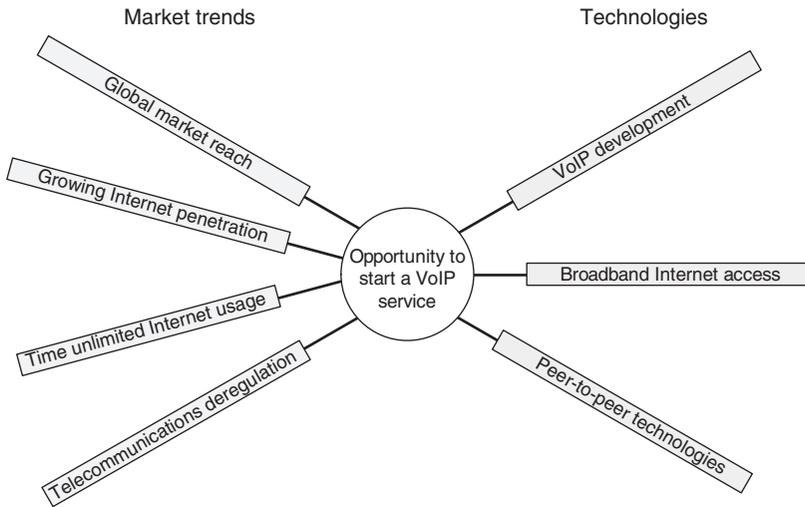


Figure 4.2 Opportunity for Skype as a combination of market trends and emerging technologies

tested with Kazaa could be implemented. The success and the mistakes they made with their previous venture gave them self-confidence and big plans for the new venture, best seen in the claim that 'we're not here to try to make some small business' (Q16). The process of opportunity development was simultaneous with the process of opportunity identification as the way the entrepreneurs wanted to develop the opportunity was one of the key criteria when looking for a suitable opportunity to pursue. Figure 4.3 includes the entrepreneurs in the model as well as a separate dimension for entrepreneurial opportunity development.

MODEL GENERALIZATION AND THEORETICAL DISCUSSION

Kirzner (1979) defines an entrepreneurial opportunity as an imprecisely defined market need or underemployed resource that is present at a specific moment in time, while Shane and Venkataraman (2000) propose that entrepreneurial opportunities are those situations in which new goods, services, raw materials and organizing methods can be introduced and sold at greater than their cost of production. The second, more adopted definition was later criticized because it inevitably contains the final result

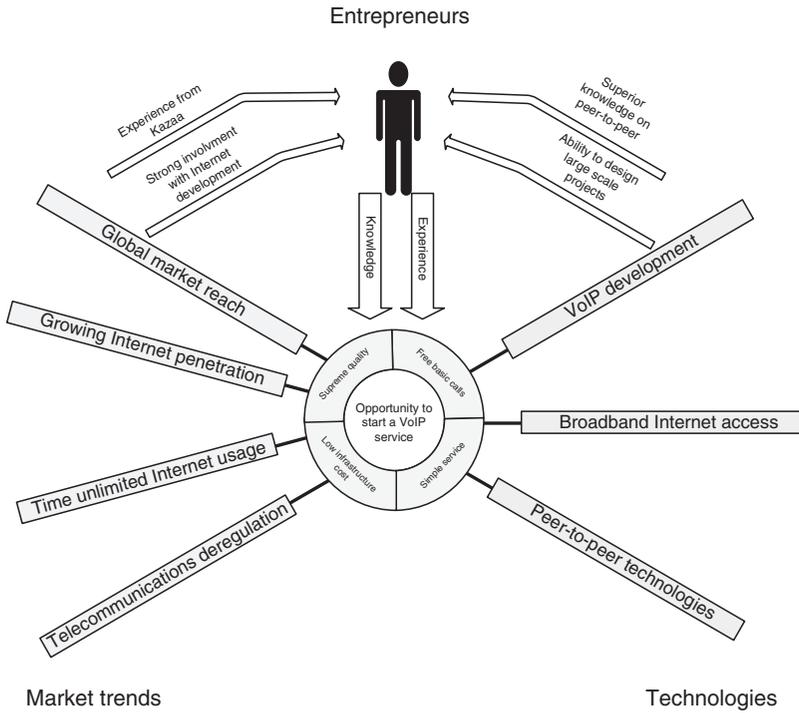


Figure 4.3 Opportunity for Skype as a combination of market trends, emerging technologies influenced by knowledge and experience of the entrepreneurs

of their realization (the creation of future goods and services). Such a view is time-neutral – it pertains to opportunities now, yet deems them as such only after knowing future outcomes. As uncertainty cannot be removed from our world it is impossible to perceive an opportunity *ex-ante*, therefore opportunities could only be claimed as such retrospectively. Therefore in order to avoid foreknowledge the opportunities should be looked at through the ‘worldviews’ of individuals (Dimov, 2007a).

In the studied case the entrepreneurs offered an alternative view on what entrepreneurs do when they look for opportunities ‘it is about trying to see what are the technical capabilities and what are the consumer trends and try to connect the dots’ (Q10).

The idea of opportunities being perceived possibilities of junctures of favourable circumstances as seen by the entrepreneurs fits to the two-phase view of opportunity identification and development. In the

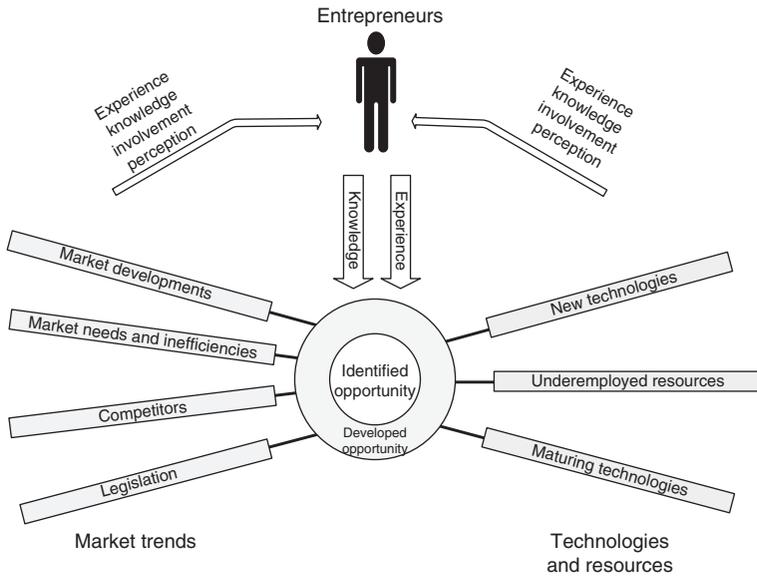


Figure 4.4 Proposed model of opportunity identification and development

opportunity identification phase, the entrepreneurs process the different signals from the market, strongly influenced by their involvement, knowledge and experience, and try to fit them with their perception, knowledge and experience on technological development and available resources. The insight happens when the different signals collide in what entrepreneurs perceive could be a possible juncture of market needs, available resources and technologies. We propose that the result of the opportunity identification in the entrepreneurship process is the perceived possibility to create a juncture of circumstances that is the identification of the dots and the perceived belief that it is possible to connect them.

Instantly, together with the realization that a possible juncture of circumstances could exist, the entrepreneurs begin the process of opportunity development or firm design (as proposed by Sarasvathy, 2004), which is the design of how the dots should be connected. The art and craft of connecting the dots seems a promising field for future research as it is a scarcely studied, yet extremely important phase in the entrepreneurial process.

The grounded model in Figure 4.3 is case-specific and is more applicable for technological entrepreneurship as it strongly emphasizes the role of technology. Therefore in our attempt to propose a more general model,

we build on Kirzner's (1979) definition of entrepreneurial opportunities further enhancing both sides of the model as shown in Figure 4.4.

Case-specific technologies and market trends are replaced by more case-general categories, and resources are added to the model.

The studied case shows that the way the entrepreneurs want to develop an opportunity can also strongly influence the opportunity identification itself, as entrepreneurs could see more potential in certain business models thus influencing their perception of which trends and developments are potentially interesting.

Our research also further emphasized the role of an individual in the identification and development of opportunities. Experience, knowledge and the involvement of entrepreneurs with specific markets and technologies proved to be crucial parts of both opportunity identification and development.

NOTES

1. As opportunities are defined by Webster's online dictionary.
2. The terminology used depends on the ontological view followed.
3. The complete list of quotations can be found in one Appendix.

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APPENDIX

Table 4A.1 List of quotations

<p>Q1 A lot of things are of course timing and luck. But you always hear someone say. . . we hear it so many times: it has already been done before, there is a product out there. If you are entrepreneurial you have to say fine. . . all this things have been made but haven't been made good.</p>	<p>Niklas Zennström: interview at SIME 2007 conference</p>
<p>Q2 The other thing is I think also timing.. We launched Skype. . . There was good timing I think. . . People were having more and more broadband connections. If we would have launched Skype three years earlier we wouldn't have taken off as people were using much more dial up connections.</p>	<p>Niklas Zennström: SevenLoad interview, 22 January 2007</p>
<p>Q3 After Niklas Zennström and I did Kazaa, we looked at other areas where we could use our experience and where P2P technology could have a major disruptive impact. The telephony market is characterized both by what we think is rip-off pricing and a reliance on heavily centralized infrastructure. We just couldn't resist the opportunity to help shake this up a bit.</p>	<p>Janus Friis: 'Why VoIP is music to KaZaa's ear', 23 November 2003</p>
<p>Q4 Kazaa set the stage for Skype. While considering what to do after Kazaa, Zennström says he and Friis thought about how 'any digital content should be delivered over the Internet because it's so much more efficient.'</p>	<p>Niklas Zennström: 'Disrupter man goes after TV this time', USA Today, 12 June 2006</p>
<p>Q5 With our work at Kazaa, we began seeing growing broadband connections and more powerful computers and more streaming multimedia, and we saw that the traditional way of communicating by phone no longer made a lot of sense.</p>	<p>Niklas Zennström: Engadget interview, 8 November 2004</p>
<p>Q6 I remember us saying (around 2002) that Internet telephony should work by now. We certainly didn't invent Internet telephony, but it wasn't very good and was too hard to use.</p>	<p>Niklas Zennström: 'Disrupter man goes after TV this time', USA Today, 12 June 2006</p>

Table 4A.1 (continued)

<p>Q7 The time is right to take on Internet telephony. Broadband penetration is high enough, and people are ready for it; it's been an unfulfilled promise for years. P2P technology is really very well suited for Internet telephony, so it is a natural next phase</p>	<p>Janus Friis: 'Why VoIP is music to KaZaa's ear', 23 November 2003</p>
<p>Q8 P2P is a widely used and abused term. Software is not peer-to-peer just because it establishes direct connections between two users; most Internet software does this to some extent. True P2P software creates a network through which all clients join together dynamically to help each other route traffic and store information. The power of the network grows with the number of users.</p>	<p>Janus Friis: 'Why VoIP is music to KaZaa's ear', 23 November 2003</p>
<p>Q9 The telephone is a 100-year-old-technology. It's time for a change. Charging for phone calls is something you did last century.</p>	<p>Niklas Zennström: Engadget interview, 8 November 2004</p>
<p>Q10 It is about trying to see what are the technical capabilities and what are the consumer trends and try to connect the dots. But it is also a lot about gut instinct and just go for it.</p>	<p>Niklas Zennström: interview at SIME 2007 conference</p>
<p>Q11 First it is not about crushing industries. It is about creating opportunities. Usually it is like: Why is somebody not doing that? It is not a method. There are discussions. . . the most important thing is the ability to question things.</p>	<p>Niklas Zennström: interview at SIME 2007 conference</p>
<p>Q12 Those calling for Skype to further increase revenues from users fail to understand the balance that must be struck between seeking profits and supporting expectations built around free phone calls. Some people may want to monetize faster but the key is to figure out what is the right speed of monetization. If you act too aggressively there is a real risk you will lose the huge active user base.</p>	<p>Niklas Zennström: interview for thomascrampton.com, 1 October 2007</p>

Table 4A.1 (continued)

<p>Q13 Skype is addressing all the problems of legacy VoIP solutions: bad sound quality, difficult to set up and configure, and the need for expensive, centralized infrastructure. No one has seriously addressed these problems before, and this is why VoIP has never really taken off.</p>	<p>Janus Friis: 'Why VoIP is music to KaZaa's ear', 23 November 2003</p>
<p>Q14 Vonage is much more similar to Verizon and AT&T than to us. With Vonage, you're using a regular telephone, dialling a number, and its services have rates similar to the telecoms. What we are doing is taking advantage of the broadband Internet to provide basically unlimited free calls to anyone at a higher voice quality than they can with the phone lines.</p>	<p>Niklas Zennström: Engadget interview, 8 November 2004</p>
<p>Q15 We want to make as little money as possible per user. We don't have any cost per user, but we want a lot of them.</p>	<p>Niklas Zennström: 'The meaning of free speech', <i>Economist</i>, 2005</p>
<p>Q16 There is multibillion dollars in potential in Skype. We're not here to try to make some small business.</p>	<p>Niklas Zennström: 'Disrupter man goes after TV this time', <i>USA Today</i>, 12 June 2006</p>

