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MASTER'S THESIS

**DYNAMIC CAPABILITIES IN SMEs: THE INTEGRATION OF
EXTERNAL COMPETENCIES IN NICHE PLAYERS IN THE
IT INDUSTRY**

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Študent **Marko Čoh** izjavljam, da sem avtor tega magistrskega dela, ki sem ga napisal pod mentorstvom **prof. dr. Miroslava Glasa** in somentorstvom **prof. dr. Marka Torkkelija**, ter skladno s 1. odstavkom 21. člena Zakona o avtorskih in sorodnih pravicah dovolim objavo magistrskega dela na fakultetnih spletnih straneh.

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1. INTRODUCTION

With the new distribution of global economic activity Europe faces new challenges. China has become the production facility for the world, India is gaining the upper hand in business processes outsourcing and 'Asian tigers' such as Taiwan have regained their competitive strength after the financial crisis. Many authors, including myself, believe that firms in Europe can maintain and strengthen their position in global markets only on the basis of innovative application of the most advanced technologies and, perhaps even more importantly, on the basis of innovative approaches to business strategy. The first aspect is necessary because European firms can keep up with Chinese and Indian rivals, who enjoy significant cost advantages, only by being one step ahead, i.e. by providing products and serviced based on technologies Asian rivals do not yet have the access to. As this is becoming increasingly hard due to the fast build-up of stock of intellectual capital in China and India (in both countries more people graduate per year than in Europe), being able to craft and execute an innovative strategy is becoming all the more important. Successful European firms of the following decade will blend technological sophistication of their offerings with strategy designed on the basis of internal and external competencies and capabilities.

When we discuss European firms, it is worth examining what kind of firms these actually are. Brief examination of the data reveals that 99,8% of enterprises in Europe are small and medium-sized enterprises (SMEs) (Source: Eurostat). Vast majority of these enterprises are micro enterprises (less than 10 employees). SMEs employ approximately 70% of the European workforce. These data indicate that a typical European firm is an SME and suggest that examination of strategy of European firms should be conducted on the level of strategy of SMEs. Given this suggestion and my academic interest in management of entrepreneurial ventures I set out to study the following question: what kind of strategy should SMEs adopt to systematically develop sources of competitive advantage. I focus my study on SMEs operating in dynamic markets, characterized by fast and relatively unpredictable technological and environmental changes.

To provide a solid theoretical foundation for the study I present review of the most relevant concepts in the strategic management literature and then turn to dynamic capabilities approach as the frame of reference for my study. On the basis of seminal theoretical contributions to the field of dynamic capabilities I discuss potential of dynamic capabilities to confer competitive advantage upon firms. I argue that firms stand better chance of developing sources of competitive advantage in cooperation with organizations and individuals in their environment than by going it alone. I fine-tune this argument by specifying types of networks and inter-organizational linkages that are potentially beneficial for SMEs. I hypothesize that SMEs may benefit from cultivating relationships with those major firms in their environment that employ particular type of strategy termed the keystone strategy. I review the empirical literature on dynamic capabilities to provide answers on how can SMEs capitalize on such

relationships and which organizational processes support leveraging of the relationships. I conclude that relatively little theoretical and empirical work has so far been conducted to shed light on integration of external competencies, which is the set of activities central to leveraging of relationships with major firms.

In an attempt to fill in this research gap I propose framework for strategy for SMEs operating in dynamic markets. The framework is built on the basis of three building blocks: participants in a business network/ecosystem (keystone players and niche players), relationships among them and dynamic capabilities that SMEs employ to build sources of competitive advantage. I argue that combination of dynamic capabilities SMEs need to employ revolves around leveraging relationships with the keystone players, and term this combination the relationship capability. To illustrate the proposed concept I present findings of study of six European niche players in the information technology (IT) industry that have built competitive advantage in their business segments and develop their strategy on the basis of relationship with Microsoft. I discuss how these niche players deploy dynamic capabilities to support their distinctive strategic orientations and provide evidence that supports notion that niche players stand to benefit from relationships with major firm. In the conclusion I discuss contributions of my study to strategic management and entrepreneurship literature, as well as to the growing body of literature at the intersection of the two research streams.

2. CONTEMPORARY STRATEGIC MANAGEMENT APPROACHES

The field of strategic management is dedicated to the explanation of differences in firm performance. Strategists are particularly interested in conditions which lead to improvements in performance and sustainable competitive advantage. The level of analysis (of strategy formulation) has deepened from an explanation of observed inter-firm profitability differences, through an understanding of the intrinsic firm heterogeneity (and hence durable intra-industry profit differences), to an examination of the dynamic routines that produce heterogeneous firms (Collis, 1994).

Through the 1980s the dominant model was the *industrial economics approach* (Porter, 1980). In this approach (as well as in a closely related *strategic conflict approach*, see e.g., Shapiro, 1989), the key aspect is the industry or industries in which a firm competes. The inherent profit potential of an industry is determined by five industry level forces — barriers to entry, threat of substitution, bargaining power of buyers, bargaining power of suppliers and rivalry among incumbent firms. The sources of profitability are therefore seen to be the characteristics of the industry as well as the firm's position within the industry. Porter's framework and other insights of industrial organization economics suffer from several limitations though. These include tautology, cross-sectional rather than longitudinal analysis and too great emphasis on the effect of the industry structure on firm's performance (Black and Boal 1994). In particular, the industry-centered view is problematic since from this

perspective the process of identifying and developing the requisite assets involves nothing more than choosing rationally among a well defined set of investment alternatives. On the other hand, a growing body of literature has highlighted the importance of firm-specific factors and the relative unimportance of industry effects in explaining firm performance. For example, a study by Cool and Schendel (1988) showed that there are systematic and significant performance differences among firms within the same (U.S. pharmaceutical) industry, and a study by Rumelt (1991) showed that profit differences within industries exceeded those between industries. Many authors have therefore argued that strategy formulation starts properly not with an assessment of the organization's external environment and product/market opportunities, but with an assessment of the organization's internal resources, capabilities, and core competencies.

One can also consider the efficient strategy-structure relationship. Here the strategic efficiency refers to the realization of sustainable competitive advantages in the form of strategic rents of the firm (where a rent is defined as a surplus of revenue over cost). Depending on the origin of competitive advantage, different strategic rents can be realized (see e.g. Amit and Schoemaker, 1993, Mahoney and Pandian, 1992). If the competitive advantage results primarily from monopolistic advantages (firms in the industry are somehow able to impede the competitive forces in either product markets or factor markets), as argued by Porter, the strategic choice depends on the generation of monopolistic rents (Teece, 1984). If, on the other hand, the competitive advantage is primarily based on knowledge advantages due to specific resources, capabilities and competencies, Ricardian and Schumpeterian rents can be realized (Peteraf, 1993; Mahoney and Pandian, 1992).

The difference between these two views is related to the transition of the frontier of strategy research to the *resource-based view of the firm* (RBV). RBV is an influential theoretical framework which focuses on the internal organization of firms and factor market imperfections. It highlights the heterogeneity of firms, their varying degrees of specialization, and the limited transferability of corporate resources. The strategy process then revolves around identification and exploitation of idiosyncratic resources and distinctive competencies (Clark 2000). RBV is also a complement to the traditional emphasis of strategy on industry structure and strategic positioning within that structure (Henderson and Cockburn, 1994; Eisenhardt and Martin, 2000). It recognizes the need to create products which add value for customers (i.e. market factors), but looks internally for sources of competitive advantage.

The resource-based logic has been taken further in the *(core) competence* approach to strategy. This view, developed by Prahalad and Hamel (1990), argues that it is the core competencies of a firm, not discrete, individual assets, which are the source of sustainable competitive advantage. These core (organizational) competencies in turn lie behind a firm's ability to bundle together generic resources (skills and technologies). Core and generic resources together enable an organization to provide unique value to customers. As core competencies are the result of 'collective learning' processes and manifested in business

activities and processes, they also often span over multiple products or markets (Hamel, 1994; Sanchez and Heene, 1997). Comparing with the RBV, this approach emphasizes the development of the right competencies for long-term success of a firm. It should be emphasized that even though the core competence approach is only one of many contributions within the resource-based view of the firm, it stands out from the rest as it has attracted considerable interest from practitioners around the world.

More recently, scholars have extended RBV to dynamic markets. The rationale is that RBV does not adequately explain how and why certain firms sustain their competitive advantage in changing business environments. Teece et al. (1997) expand on the resource-based view of the firm to explore the possibility of a theory of '*dynamic capabilities*', which are defined as "the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments". Zollo and Winter (1999, 2002), on the other hand, suggest that dynamic capability should be defined more specifically in terms of the generation and modification of a firm's operational routines. There thus seems to be a lack of consensus on the nature and scope of dynamic capabilities. Nevertheless, the role of learning in building new competencies is central to different analyses. Moreover, while dynamic capabilities are idiosyncratic in their details and path dependent in their emergence (which complicates definitions), they still seem to have significant commonalities across firms. Extensive empirical research streams support the view that there are 'best practices' in specific strategic and organizational processes like product development, alliancing, and strategic decision making (Eisenhardt and Martin, 2000).

The last three views all advocate that the competitive strategy is shaped by exploiting or redeploying firm's resources or competencies/capabilities. In the following, I will review these 'contemporary approaches' to strategic management in more detail and analyze their common elements and differences. Concepts such as resources, capabilities, competencies, and core competencies will be also discussed, since these are not always clearly defined in the literature. For example, in some early contributions capabilities are considered as part of resource (e.g. Wernerfelt, 1984; Marino, 1996), while most authors argue that capabilities are more dynamic and complex entities, and should be treated independent of resources. Furthermore, the concept of core competences has been frequently used in the literature without a clear definition. These kind of generalized terms thus may become an obstacle in understanding many contemporary management concepts.

2.1 Resource based view (RBV)

The resource-based view emphasizes firm-specific assets and the existence of isolating mechanisms as the fundamental determinants of firm performance. Elements of the approach can be found in Schumpeter (1942) and Penrose (1959), of which the latter is considered a very influential source. Moreover, the notions of fundamentally heterogeneous firms (in terms

of their resources and internal capabilities) and distinctive competencies were appraised already in the classic approaches to strategy formulation (Selznick, 1957; Ansoff, 1965; Andrews, 1971). Probably the first self-conscious application of a resource perspective to the field of strategy was made by Rumelt (1984), who notes that the strategic firm “is characterized by a bundle of linked and idiosyncratic resources and resource conversion activities”. Also Wernerfelt (1984) was early to recognize the differences between the resource perspective and product market approach. Other notable early contributors include Barney (1986, 1991), Dierickx and Cool (1989), and Conner (1991).

RBV assumes that the sustainable competitive advantage is acquired by accumulating ‘valuable’ resources and capabilities. It is difficult, however, to determine a priori what the resources which might lead to strategic rents are. Researchers have therefore introduced different frameworks in order to assess the economic performance of resources. For example, Barney (1991) argues that resources and capabilities (as strategic assets) are more valuable if they are rare, difficult to imitate and non-substitutable (so-called VRIN attributes). In this framework, the rareness of a resource depends upon the physical rareness in factor markets and/or the rareness of the perceived value of the resource due to a firm's particular resource combination; imperfect imitability results from the imperfect factor markets characterized by restricted information, the cost of recreating the specific combination of resources that give a synergistic result, or a combination of the two. Further non-substitutability rests on the continuation of imperfect factor markets, the cost involved in the recreation of specific combination, or the cost of finding a new combination of resources that will enable the firm to compete in the same product market (Black and Boal, 1994).

The VRIN-framework, on the other hand, treats the evaluation of resources from a stand alone viewpoint ignoring how resources are nested in and configured with one another. Interfactor relationships have been considered in Teece's (1986) discussion of co-specialized assets and Amit and Schoemaker's (1993) notion of complementary relationships affecting the value of a resource. Sanchez and Heene (1997) also argue that the strategic value of a given resource is dependent on the way a firm combines, coordinates, and deploys that resource with other firm-specific and firm-addressable resources (i.e., resources that lie outside the boundaries of the firm but can nevertheless be used by the firm). One should also notice that not all resources can be traded. Some resources are developed within the firm and cannot be bought or sold in factor markets (examples of these include reputation, culture, firm-specific know-how, and values). These strategic assets may be particularly difficult for competitors to imitate because of time compression diseconomies, asset mass efficiencies, interconnectedness of asset stocks, asset erosion, and causal ambiguity (Dierickx and Cool 1989).

Integrating various streams of research, Peteraf (1993) developed a resource-based model of the theoretical conditions which underlie competitive advantage. There are four conditions that must be met: superior resources (heterogeneity within an industry), ex post limits to competition, imperfect resource mobility, and ex ante limits to competition. First, firms

endowed with superior (most efficient) resources are able to produce more economically and/or better satisfy customer wants (and thus earn rents). Second, subsequent to a firm's gaining a superior position and earning rents, there must be forces which limit competition for those rents. In RBV the two critical factors which limit ex post competition are imperfect imitability and imperfect substitutability. Third, imperfect mobility means that certain resources are tradable but more valuable within the firm that currently employs them than they would be in other context. In other words, resources are imperfectly mobile when they are somewhat specialized to firm-specific needs. Finally, prior to any firm's establishing a superior position, there must be limited competition for that position. For example, Barney (1986) argues that the economic performance of firms depends not only on the returns from their strategies but also on the costs of implementing those strategies. Ex ante uncertainty thus limits the competition.

Firm resources have also been decomposed into combinations of resource 'factors' or 'assets'. Barney (1986), for example, argues that resources differ in their 'tradability' and that tradable factors' availability and monetary value in the strategic factor markets will reflect the market's awareness of those factors' rareness. Dierickx and Cool (1989), on the other hand, suggest that resources should be differentiated as either asset flows or asset stocks: an asset flow is a firm resource that can be obtained or adjusted immediately and an asset stock is a firm resource which cannot be adjusted immediately but is built over time from asset flows. Furthermore, several resource level categorizations have been presented in the literature. According to Grant (1991), six major categories of firm resources have been suggested: financial, physical, human, technological, reputation, and organizational. Grant, however, notes that identifying and appraising firm's resources is difficult because management information systems typically provide only a fragmented and incomplete picture of the firm's resource base. Especially the heterogeneity and imperfect transferability of intangible assets precludes their valuation.

To summarize: the early RBV literature identifies the conditions under which the underlying resources that create the sustained competitive advantage cannot be instantaneously and easily imitated. The more recent focus of RBV, on the other hand, reflects the managerial literature by endorsing the virtues of organizational capabilities as a valuable source of competitive advantage. There have been various definitions of and distinctions between resources and capabilities in the literature. Amit and Schoemaker (1993, p. 35), for example, define resources as "stocks of available factors that are owned or controlled by the firm. Resources are converted into final products or services by using a wide range of other firm assets and bonding mechanisms such as technology, management information systems, trust between management and labor, and more". Resources thus consist of know-how that can be traded (e.g., patent and licenses), financial or physical assets (e.g., property, plant and equipment), human capital, etc. Capabilities, in turn, are defined as "a firm's capacity to deploy resources, usually in combination, using organizational processes, to affect a desired end. They are information-based, tangible or intangible processes that are firm-specific and are developed over time through complex interactions among the firm's resources". Amit and Schoemaker

further argue that capabilities are based on developing, carrying, and exchanging information through the firm's human capital and are often developed in functional areas (e.g., brand management in marketing) or by combining physical, human, and technological resources at the corporate level.

Firms may build corporate capabilities, for example, as a highly reliable service, repeated process or product innovations, manufacturing flexibility, responsiveness to market trends, short product development cycles etc. The capabilities literature thus attributes competitive advantage to the ability to continually develop valuable new product features before competitors. Those capabilities, which reside in a firm's tacit collective knowledge, are causally ambiguous and path dependent (and so cannot be instantaneously imitated). Capabilities researchers have therefore been searching for the organizational structures and behaviors that are likely to generate effective product innovation.

2.2 Competence/capabilities-based perspective

The idea of using competencies/capabilities in strategy formulation received much attention after the concept of 'core competence' was introduced by Prahalad and Hamel in 1990. In their 'practitioner's guide', Prahalad and Hamel (1990, p. 80) defined core competencies as "the collective learning in the organization, especially how to co-ordinate diverse production skills and integrate multiple streams of technologies". Similar concepts had been presented earlier, though. Various authors had called them, for example, distinctive competences (Snow and Hrebiniak, 1980), resource deployments (Hofer and Schendel, 1978) and invisible assets (Itami, 1987). Other related concepts have been introduced since then: e.g. Leonard-Barton (1992) uses core competence's close equivalent, 'core capability'. It is notable that concepts 'competence' and 'capability' are often used interchangeably in the literature. Marino (1996), however, made a distinction between them: competencies have a technology or knowledge-based component (in particular they often result from a blending of technology and production skills), while capabilities are rooted more in processes and business routines. He notes, however, that the distinction should not distract us—both represent strategically relevant assets. Consequently, competencies and capabilities that differentiate a company strategically should be considered 'core' (Leonard-Barton, 1992).

While there are differences in terminology and emphasis, various definitions of core competencies imply purposeful managerial configuration and orchestration of the firm's structures, collective routines and personal initiatives. Mechanisms through which knowledge is integrated within firms and hence new competencies created are also often emphasized. For example, Markides and Williamson (1994) define core competencies as a pool of experience, knowledge, and systems that together can act as catalysts that create and accumulate new strategic assets. Pitt and Clarke (1999) note that distinctive competencies/capabilities to a large extent consist of non-codified (tacit, idiosyncratic), comparatively scarce and

imperfectly distributed know-how, which hides the links between intellectual inputs and tangible outputs. In consequence, core competencies are usually assumed to be difficult or impossible to imitate (thus constituting competitive advantage). According to Mascarenhas et al. (1998), the core competencies identified in prior studies fall into three basic groups: superior technological know-how, reliable processes and close relationships with external parties (suppliers, regulators, professional organizations, distributors and customers). Few authors within the core competence literature, on the other hand, specify particular competencies. Turner and Crawford (1994) make an exception by distinguishing 11 generic competencies (performance management, resource application, motivating and enthusing, integration of effort, enaction, communication, commitment formation, path finding, development, systems/process engineering and option management). Competence in each of these areas influences the strategies a firm can formulate.

There have also been several definitions and classifications of organizational capabilities (see e.g. Collis 1994; Henderson and Cockburn 1994). Collis (1994) classifies different definitions into three categories: capabilities that 1) reflect an ability to perform the basic functional activities of the firm (such as plant layout, distribution logistics, and marketing campaigns) more efficiently than competitors, 2) share the common theme of dynamic improvement to the activities of the firm, and 3) comprise the more metaphysical strategic insights that enable firms to recognize the intrinsic value of other resources or to develop novel strategies before competitors. Collis (p. 145) himself defines capabilities as “the socially complex routines that determine the efficiency with which firms physically transform inputs into outputs”. According to Collis, in this definition organizational capabilities are embedded in firm routines and those routines are a product of the organization as an entire system. In other words, capabilities are not only manifestations of observable corporate structures and processes, but also reside in the corporate culture and network of inter-firm relations. Furthermore, capabilities can be considered both as a direct improvement to efficiency, such as continuous improvement in manufacturing process capability, and as the ability to conceive of new ways to create value. Marino (1996) also stresses the complexity of core capabilities as they involve the interactions of both individuals and structures.

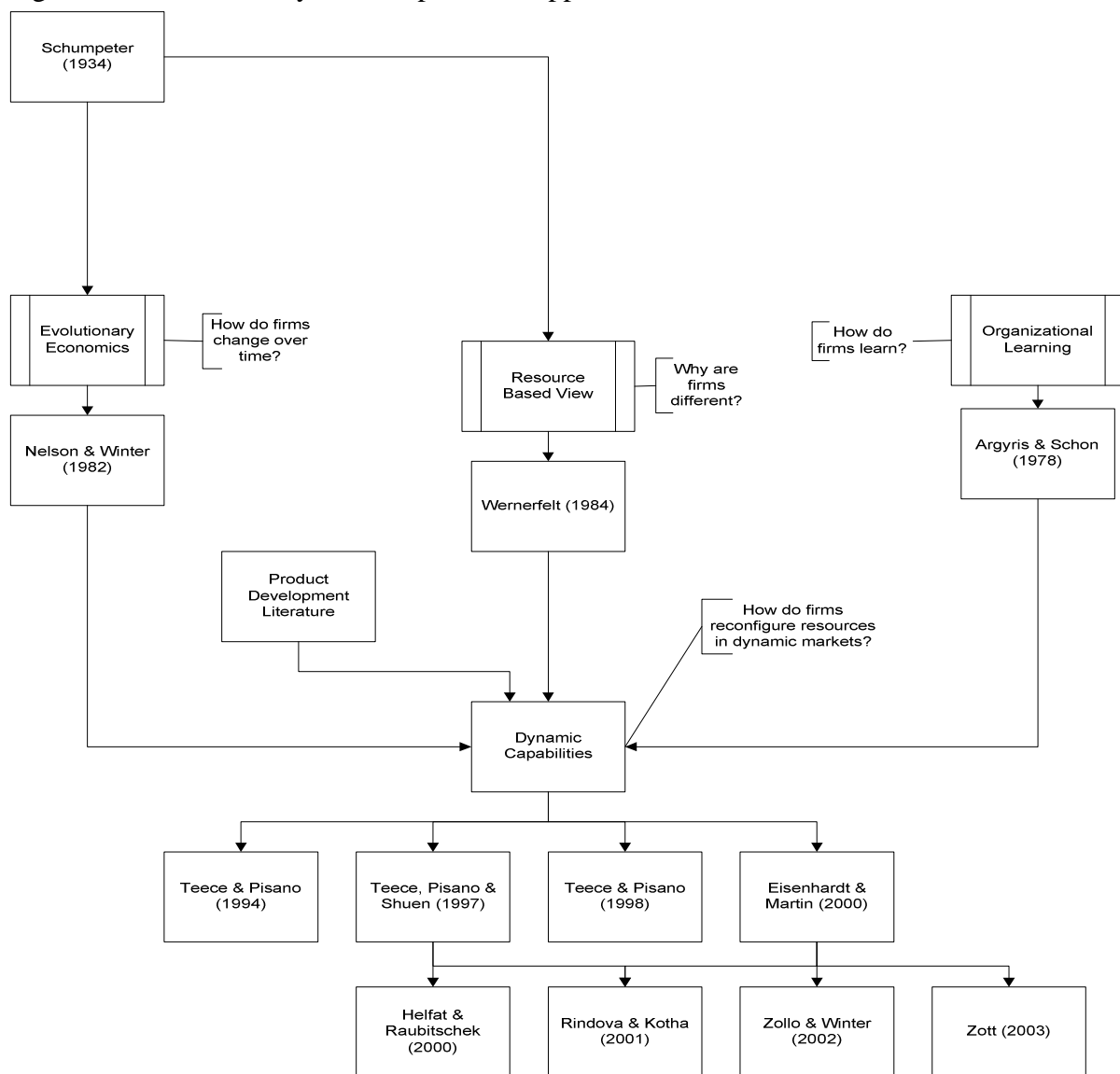
Hamel and Prahalad (1994) further argue that it is particularly important for an organization to be preemptive in its development and alignment of competencies in order to lead the way into new products and services. Moreover, only those organizations that continue to invest and upgrade their competencies are able to create new strategic growth alternatives and sustain competitive advantage (Reed and DeFillippi, 1990). Besides, core competencies cannot remain static as they must be continually evolving and changing via organizational learning (Lei et al. 1996 hence call these kind of core competencies ‘dynamic’). Prahalad and Hamel (1990) in fact suggest that a strategy should be learning-driven (organizational learning alone does not translate into a core competence, however; rather, the learning efforts must be turned into firm-specific skills and resources). The linkage between organizational learning and core competencies has also been established in several other studies (e.g. Fiol

1991; Hamel 1991). In the capabilities literature the role of learning is central to the theory of dynamic capabilities.

3. DYNAMIC CAPABILITIES – THE CONCEPT

The concept of dynamic capabilities is an emerging paradigm in the field of strategic management. Authors that have been developing the concept have endeavored to identify sources of competitive advantage of firms in dynamic markets and have presented mechanisms that underlie effective deployment and development of dynamic capabilities. Intellectual antecedents to dynamic capabilities approach include evolutionary economics (Nelson and Winter, 1982), resource based view of the firm (Wernerfelt, 1984) and organizational learning (Argyris and Schon, 1978). The former two research streams build on pioneering work by Schumpeter (1934). Since mid 1990s, a number of authors have contributed theoretical and empirical pieces of research that have highlighted various aspects of dynamic capabilities. Figure 1 presents evolution of dynamic capabilities approach, along with key research questions and literature pertaining to relevant antecedent research streams.

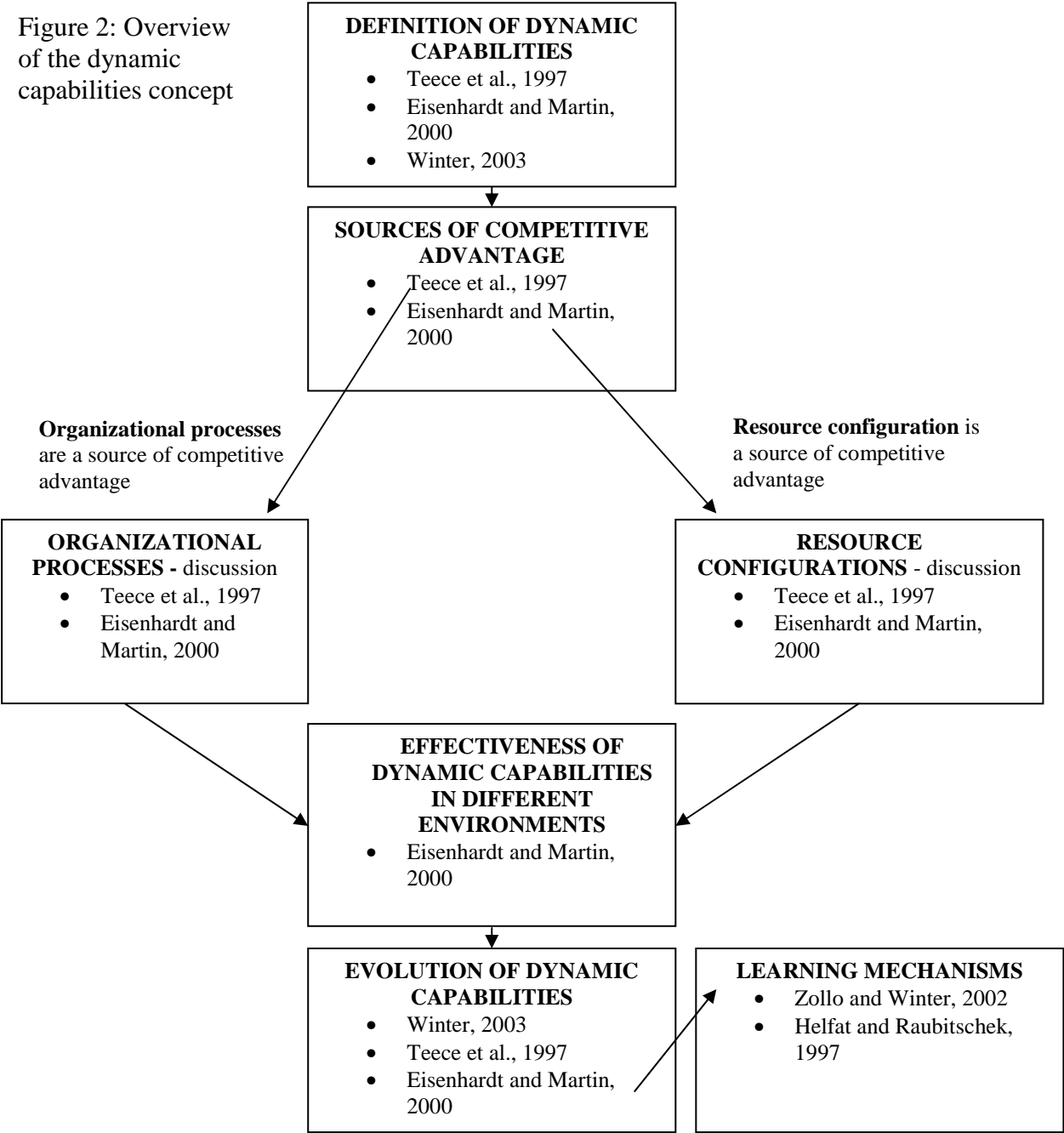
Figure 1: Evolution of dynamic capabilities approach



Given that general consensus on nature and properties of dynamic capabilities has not yet emerged, I will provide comprehensive overview of the concept by contrasting and integrating key points of most notable contributions addressing the following issues:

- Definition of dynamic capabilities
- Sources of competitive advantage
- Effectiveness of dynamic capabilities in different environments
- Evolution of dynamic capabilities

Figure 2 sums logical flow of this overview.



Most notable contributions to dynamic capabilities literature include seminal articles by Teece et al. (1997) and Eisenhardt and Martin (2000), and a research note by Winter (2003). In the next paragraphs I outline key points of these contributions on issues explicated above to provide solid theoretical foundation for empirical investigation of dynamic capabilities in SMEs.

3.1 Definition of dynamic capabilities

Teece et al. (1997) have observed that winners in the global market place have demonstrated timely responsiveness and rapid and flexible product innovation, along with managerial ability to effectively coordinate and redeploy internal and external competencies. They term this ability to achieve new forms of competitive advantage 'dynamic capabilities', to emphasize two aspects of strategy that previously weren't the main focus:

- Dynamic: to emphasize capacity to renew competencies to achieve alignment with the changing business environment
- Capabilities: to emphasize key role of strategic management in adapting, integrating and reconfiguring internal and external organizational skills, resources and competencies, to match the requirements of the environment

They define dynamic capabilities as the “firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments”. In order to comprehend that definition clarification of organizational competencies and core competencies is needed. Teece et al. define organizational competencies as “firm specific assets that are assembled in integrated clusters to enable distinctive activities to be performed” and core competencies as competencies that “define firm's fundamental business”. Examples of competence are miniaturization and systems integration, whereas imaging in the case of Kodak and integrated data processing in the case of IBM could be considered core competencies of the respective firms.

Eisenhardt and Martin (2000) define dynamic capabilities as “the firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change”. Dynamic capabilities thus are “organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die”. According to Eisenhardt and Martin managers deploy dynamic capabilities to alter resource base to generate new value-creating strategies.

Winter (2003) builds definition of (dynamic) capabilities on the broader concept of organizational routine: “an organizational capability is a high level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type”.

In other words, capability is a routine that enables managers to choose among different ways of producing output. Routine is a “behavior that is learned, highly patterned, repetitious, founded in part in tacit knowledge”.

Winter distinguishes between ordinary ('zero-level') capabilities and dynamic capabilities. While the former permit a firm to “make a living”, the latter operate to “extend, modify or create ordinary capabilities”. Winter also addresses criticisms that dynamic capabilities don't exist by presenting hypothetical example of a firm in equilibrium that exercises stationary process of selling the same product on the same scale to the same population of customers over time. Capabilities that support such process are zero-level. However, capabilities that would effectuate change of that process wouldn't be zero level. Capabilities that support geographical expansion of firms such as McDonald's are a prototypical example of higher-level capabilities, i.e. dynamic capabilities. Apart from being higher-level, these capabilities are also highly patterned and routine. Their existence is according to Winter concluding evidence that dynamic capabilities exist.

3.2 Sources of competitive advantage

Although Teece et al. and Eisenhardt and Martin provide similar definitions of dynamic capabilities, they ascribe different roles to dynamic capabilities with respect to competitive advantage. While Teece et al. contend that competitive advantage of firms in dynamic markets rests on distinctive organizational processes, shaped by firm's specific asset position, in turn shaped by firm's evolution path, Eisenhardt and Martin state that resource recombinations, rather than dynamic capabilities themselves, are the source of competitive advantage. This important distinction stems from differences in their respective treatment of organizational processes.

In Teece et al.'s view the central strategic problem is which difficult-to-imitate internal and external competencies are most likely to support valuable products and services. This problem can be rephrased as a problem of what to invest in. Since possible investment choices at any point in time are influenced by past decisions, each time a firm makes an investment it actually makes a long-term, almost irreversible commitment to particular domain of competence. Past decisions shape firm's position, which is a specific endowment of skills, technology assets, complementary assets, customer base etc. that a firm possesses in a given point in time. In contrast with microeconomics, which posits that firms have infinite range of technologies to choose from and markets to occupy, evolutionary economics (Nelson and Winter, 1982) recognizes that at any point in time firms are limited in their investment alternatives. This is so because learning tends to be local, i.e. opportunities to learn are close to previous activities. Therefore, firm's history constrains its future behavior, implying that investments are often more long term than is commonly thought.

Dynamic capabilities are organizational processes that guide investment decisions and as such instrumental to strategic competitive advantage. Organizational processes have three roles: coordination/integration, learning and reconfiguration (Teece et al., 1997). Managers perform internal and external coordination of activities. It is important how effectively they perform internal coordination, and it is becoming increasingly important for competitive advantage how they perform integration of external activities and technologies. Garvin (1988) found that quality performance was driven by special organizational routines. Additionally, Clark and Fujimoto (1991) found that differences in coordinating routines and capabilities seemed to have significant impact on performance. Furthermore, they found significant, persisting firm-level differences.

Given that organization processes are coherent among themselves and constitute relatively complex systems of activities, they are hard to copy. Since in the resource-based view, limited imitability is a necessary (but not sufficient) condition for sustainability of competitive advantage, organizational processes qualify as a source of competitive advantage. Learning is potentially even more important process than integration, as it enables tasks to be performed better and quicker. The capacity of a firm to reconfigure and transform itself, a learned organizational skill, is also valuable, especially in rapidly changing markets.

On the other hand, Eisenhardt and Martin see dynamic capabilities as consisting of specific routines that form identifiable and well-researched processes such as product development, strategic decision making and alliancing. In their view dynamic capabilities are organizational processes employed to alter resource configurations of firm. In contrast with Teece et al.'s view that organizational processes themselves act as a source of competitive advantage, Eisenhardt and Martin ascribe this role to resource reconfigurations, therefore organizational processes function as means to generate competitive advantage.

Another important distinction between Eisenhardt and Martin's and Teece et al.'s view is that the former see organizational processes as exhibiting significant commonalities across firms, whereas the latter argue that organizational processes are idiosyncratic to individual firms. Teece et al. see organizational processes as distinctive among firms. They apply resource-based view lens that sees resources as idiosyncratic and consequentially a source of competitive advantage, to organizational processes. On the other hand, Eisenhardt and Martin's view implies that there is such thing as 'best practice'. That implication strengthens their view that organizational processes themselves can not be a source of competitive advantage, as a number of firms can develop organizational processes that, although different in details, produce the same outcomes. For instance, common feature across knowledge creation processes is explicit linkage between the focal firm and knowledge sources outside the firm (particularly in high-tech firms). While these linkages are necessary for effective knowledge creation, they can take varied forms including formal alliances and informal personal relationships.

Eisenhardt and Martin go further to strengthen their assertion by providing taxonomy of organizational processes that constitute dynamic capabilities. They group these processes in four categories, which include processes that:

- Integrate resources
- Reconfigure resources
- Gain resources
- Release resources

Dynamic capabilities that integrate resources include product development routines and strategic decision making. Toyota has used its superior product development skills to achieve competitive advantage in the automotive industry. In the strategic decision making, managers integrate their business, functional and personal expertise to make choices that shape strategic direction of firms. Eisenhardt and Martin quote examples of dynamic capabilities that reconfigure resources. They include transfer processes (used by managers to replicate, transfer and recombine resources in the firm), coevolving (connecting webs of collaborations among various parts of the firm) and patching (strategic processes that re-align match up of businesses to changing market conditions and opportunities). Dell is well known for patching, as it constantly segments businesses to match shifting customer demand. Dynamic capabilities that gain resources include knowledge creation processes (crucial in industries such as pharmaceuticals, where cutting edge knowledge is essential for performance) and alliance and acquisition routines that bring new resources into the firm from external sources (Hewlett Packard has very strong alliancing process that positively affects its performance, while biotechnology firms with strong alliancing processes also exhibit superior performance). Finally, dynamic capabilities that enable firms to shed resources that are no longer needed to support competitive position are crucial when markets undergo change.

For the sake of clarity, it is worth noting what Teece et al. and Eisenhardt and Martin consider by resources. Eisenhardt and Martin, in their succinct definition, define resources as specific physical (e.g. specialized equipment), human (e.g. expertise in IT) and organizational (e.g. superior sales force) assets that can be used to implement value creating strategies. Resources include competencies that are fundamental to the competitive advantage of a firm, such as supply chain management for a retail firm or molecular biology for biotech firms. Teece et al. provide more detailed treatment of resources. They consider as resources knowledge and complementary assets, reputational assets and relational assets. They classify them in the following way:

- Technology assets: as much technology doesn't enter the market for know-how, ownership, protection and utilization of technological assets are clear differentiators among firms
- Complementary assets: technological innovations that often drive competitive advantage of firms in rapidly changing markets require use of certain related assets

- Financial assets: in the long run cash flow is the financial asset that matters
- Reputational assets: they summarize information about a firm and shape responses and attitudes of customers and competitors
- Structural assets: different structures support different types of innovation to greater or lesser degree
- Institutional assets: regulatory systems, antitrust laws, national culture etc. affect performance of firms, although they are not always entirely specific to firms
- Market assets: product market positions are important, but often fragile, therefore strategy should be formulated on basis of more fundamental aspects of firm performance, such as competencies

Common to both approaches is that they consider as resources only specialized assets, whereas those assets that can be bought and sold in the market are considered as the product factors.

3.3 Effectiveness of dynamic capabilities in different environments

Teece et al. opened the discussion of strategy in dynamic markets in the field of strategic management. The authors presented a need for conceptualization of strategy that would be suitable for such markets. They didn't address characteristics of dynamic markets in particular detail though. Eisenhardt and Martin endeavor to fill in this research gap by discussing effectiveness of dynamic capabilities in environments that differ with respect to market dynamism. They define dynamic markets as markets where changes in technologies, market participants and successful business models occur frequently, relatively fast and in a relatively unpredictable fashion. They identify two broad categories of such markets:

- Moderately dynamic markets
- High-velocity markets

In moderately dynamic markets change occurs often, however along roughly predictable and linear paths. Industry structures are relatively stable, meaning that the market boundaries are clear and the players (competitors, customers, complementers) are well known. In these markets dynamic capabilities rely primarily on existing knowledge. Managers analyze situations in the context of their existing knowledge and rules of thumb, and plan and organize activities of the firm in a relatively ordered way. Studies by Pisano (1994) and Fredrickson (1984) support notion that in the moderately dynamic markets more effective decision making involves structured, analytic and linear processes. The effective processes studied were characterized by a sequence of problem solving steps that began with comprehensive collection of data, followed by development of alternatives, extensive analysis of those alternatives and making of choice.

In high velocity markets, market boundaries are blurred, successful business models are unclear and market players are ambiguous. The overall industry structure is unclear. In these markets dynamic capabilities depend less on existing knowledge and more on rapid creation of situation-specific new knowledge. Effective dynamic capabilities in such environments are simple and often consist of a few rules that specify boundary conditions. A case in point is Yahoo's highly successful alliancing process. Yahoo's managers rely on two simple rules when considering entering a strategic alliance: 'no exclusive alliance deals' and 'basic service provided by the deal must be free'. Simple dynamic capabilities are not necessarily completely unstructured. They provide enough structure for individuals to focus their attention in an environment characterized by rapid shifts, and to have enough confidence in decisions in situations in which it is easy to become overwhelmed by anxiety. Managers in high-velocity environments rely on creating situation-specific knowledge to compensate for lack of relevant existing knowledge. They also rely on parallel consideration of multiple options, experiments and prototyping.

Effects of market dynamism on dynamic capabilities have the following implications:

- Sustainability of the dynamic capabilities varies with the dynamism of the market:
 - In moderately dynamic markets, dynamic capabilities become robust, as managers continue to gain experience with these routines and implement processes that become easily sustained
 - In high-velocity markets dynamic capabilities become difficult to sustain, as there is little structure for managers to rely on, therefore developed approaches become easy to forget. Furthermore, fragile nature of dynamic capabilities in high-velocity environments requires constant managerial energy to sustain activities in a particular direction.
- Causal ambiguity of dynamic capabilities varies with the dynamism of the market:
 - In moderately dynamic markets, causal mechanisms of dynamic capabilities (what influences dynamic capabilities and what do dynamic capabilities influence) are ambiguous because dynamic capabilities in such markets are complex and difficult to observe
 - In high-velocity markets dynamic capabilities are also causally ambiguous, however because they are simple. The reason is the presence of extensive details and it's hard to discern causal mechanism from them. In the words of one executive from a high-tech industry: 'We have the best research process in the industry, yet we don't know why'

Implication of sustainability issue is that in moderately dynamic markets competitive advantage is eroded from outside the firm, whereas in high-velocity markets the threat of eroded competitive advantage comes from inside the firm as well as from the potential collapse of dynamic capabilities.

3.4 Evolution of dynamic capabilities

Change is in the center of theoretical and empirical examination of dynamic capabilities. Generally it has been assumed that dynamic capabilities are deployed to effectuate change in positions (Teece et al., 1997), resource configurations (Eisenhardt and Martin, 2000) or zero-level/operating capabilities (Winter, 2003). However, Winter (2003) points out that there are many ways to change, and that deployment of dynamic capabilities is only one way to do so. Another way to change could be through what Winter terms 'ad hoc problem solving' to denote non-routinized, rapid response to relatively novel challenges from the environment or other relatively unpredictable events.

Therefore, according to Winter not every change or reaction to environmental shifts will involve dynamic capabilities. Their involvement will depend on balance of costs of supporting dynamic capabilities and benefits derived from their deployment. Costs associated with supporting particular dynamic capability involve costs of personnel that is dedicated to the change activities. Firms will most likely choose to invest in dynamic capabilities when the opportunities to exercise them are sufficiently frequent, as otherwise they would be at a cost disadvantage relative to rivals who rely on less costly ad hoc problem solving.

Teece et al. see development of positions that shape organizational processes as path dependent. Path dependency implies that evolution of dynamic capabilities is sequential and incremental. Firms build their future positions on their present positions, and certain future positions can be developed only through sequence of several steps. These properties of evolution of dynamic capabilities help to explain why incumbents in several industries are often 'disrupted' (Christensen, 1997) by the new entrants. Evolution of dynamic capabilities is influenced also by the management's ability to perceive technological opportunities and its assessment of those opportunities. In rapidly changing environments it becomes necessary for management to develop its perception capacity to timely and properly address environmental shifts.

Eisenhardt and Martin build on Teece et al.'s notion of path dependent evolution of dynamic capabilities, however claim that the evolution is more accurately described in terms of learning mechanisms. In their view it is learning mechanisms that guide the evolution of dynamic capabilities. They mention the following learning mechanisms:

- Repeated practice
- Codification of experience
- Mistakes
- Small losses
- Pacing of experience

Repeated practice is an important learning mechanism, as it helps people to understand processes better and so develop more efficient organizational processes. While repeated practice contributes to the evolution of capabilities by itself, the codification of that experience into formal procedures makes that experience easier to apply and facilitates development of dynamic capabilities. In their study on alliance capability, Kale, Dyer and Singh (2002) found that concentrating alliance experience in a dedicated alliance function (such as a formal body or department) was a more powerful predictor of alliance success than experience alone. Mistakes also play a role in the evolution of dynamic capabilities. One of Yahoo's rules on entering the alliances arose from negative experience in exclusive relationship with a major credit card firm. That arrangement reduced Yahoo's flexibility and it had to terminate it at a great cost. The 'no exclusive deals' rule emerged from this failed arrangement. Small losses contribute to learning in that they stimulate individuals to pay greater attention to the processes while at the same time they do not cause overwhelming frustration as big losses do. Pacing of experience influences evolution of dynamic capabilities in a positive way, as the experience that comes too fast may cause managers to make hasty generalizations whereas infrequent experience can lead to forgetting what was learned previously.

While the three approaches to the evolution of dynamic capabilities address relevant issues, they all fall short of explaining the details of the mechanism. Eisenhardt and Martin's approach comes the closest to that when the authors discuss learning mechanisms, however they don't develop coherent framework. Zollo and Winter (2002) address this shortcoming of previous contributions by developing a framework of learning mechanisms that support development of dynamic capabilities.

In their framework dynamic capabilities are shaped by co-evolution of three learning mechanisms:

- Experience accumulation
- Knowledge articulation
- Knowledge codification

In general, firms adopt mix of semiautomatic accumulation of experience and deliberate investments in knowledge articulation and codification. Zollo and Winter acknowledge that in contrast with Teece et al.'s prediction, firms integrate, build and reconfigure internal and external competencies also in environments other than rapidly changing ones. They propose definition of dynamic capabilities as "a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness". Note that this definition uses the term 'operating routines'. Since operating routines constitute competencies, the terminology is in line with the one proposed by Teece et al.

Zollo and Winter's definition describes dynamic capabilities as stable and persistent, therefore they are exhibited by firms that develop their operating processes through relatively stable process improvement activities. Zollo and Winter classify approaches to process improvement activities as experience accumulation, knowledge articulation and knowledge codification. Central issue that they seek to address with their framework is what kind of mix those activities are firms likely to pursue in different situations.

In static environments firms are most likely to rely on experience accumulation. The reason is that in such environments even small amount of learning can endow organization with organizational routines that permit competitive advantage for a period of time, making dynamic capabilities unnecessary. Experience accumulation by few key individuals in the organization usually suffices in static environments. But in the conditions of rapid change reliance on the unchanged routines may prove dangerous over time. Such conditions may require development of routines of even higher level than dynamic capabilities. Firms need to deliberately invest to develop those routines that are termed knowledge articulation routines and knowledge codification routines by Zollo and Winter. Knowledge articulation routines include processes through which implicit knowledge is articulated in collective discussions, debriefings and performance evaluation processes. Knowledge codification routines are a step beyond knowledge articulation routines and require higher level of cognitive effort. During processes of knowledge codification, such as writing of a manual or guidelines, individuals will almost certainly achieve higher level of understanding. This outcome of codification efforts is often underestimated in favor of more tangible outcomes such as a set of guidelines, however it represents important contribution to the evolution of dynamic capabilities.

There are differential costs in investments in different types of learning mechanisms. A firm incurs the lowest costs with the experience accumulation, as individuals semi-automatically adapt in reaction to unsatisfactory performance. Higher costs are incurred with knowledge articulation processes due to time and energy invested to meet and discuss. Knowledge codification processes require the highest investment, as the team has not only to meet and discuss but also actually prepare a document or a tool.

There are several contingencies under which deliberate investments are justifiable as they are likely to produce higher effectiveness of processes. Those contingencies are:

- Environmental conditions (such as the pace of technological development):
 - In high-tech industries there is a tradeoff between benefits of cognitive simplification arising from knowledge articulation and codification and opportunity costs of time when key individuals are engaged in articulation and codification processes
 - In less turbulent environments knowledge articulation and codification seem superior to experiential knowledge building

- Organizational features: organizations where management has been successful in instilling acceptance of change are likely to obtain higher returns from learning at any given level of investment because they tend to be more effective at directing behavior in exploiting new understanding
- Task features:
 - Frequency: at higher frequency, knowledge accumulation is relatively more efficient; at lower frequency, knowledge codification becomes increasingly effective
 - Heterogeneity: more explicit mechanisms will be more effective than knowledge accumulation at higher levels of task heterogeneity
 - Causal ambiguity: learning investments will be more justified in situations of higher causal ambiguity, as cognitive efforts should help penetrate the ambiguity

The notion that knowledge articulation and codification are superior when heterogeneity of tasks is high and their frequency is low runs contrary to the current codification logic. A bank, for instance, will probably codify its branch operations, but not experience with an acquisition. The reason lies in belief that costs of codification are justified only by outputs, not learning benefits of process themselves. Zollo and Winter's framework makes an important contribution to the reexamination of this logic by highlighting that capability building exercises in the form of knowledge articulation and codification routines can affect level of firm's performance due to the improved understanding of operating routines and dynamic capabilities. In doing so, the framework also helps to build coherent picture of the evolution of dynamic capabilities and the evolution of sources of competitive advantage.

Zollo and Winter's framework presents a comprehensive treatment of learning mechanisms that underlie evolution of dynamic capabilities. However, to be able to understand how learning supports development of products and services, we need a model that addresses linkages between learning and development of dynamic capabilities and between dynamic capabilities and development of products and services.

Such model was proposed by Helfat and Raubitschek (1997). It explains how the co-evolution of organizational knowledge, capabilities and products over long time spans can result in competitive advantage through innovations and linkages between sequential generations of products. Although Helfat and Raubitschek refer to products, model is generic enough so that it can be applied to services as well.

The model consists of three components:

- Systems of knowledge
- Product sequencing
- Systems of learning

Systems of knowledge include core knowledge and integrative knowledge. Core knowledge forms the foundation for (multiple) products and services, whereas integrative knowledge is the knowledge of how to integrate different activities, capabilities and products within or across vertical chains (sets of activities that enable production of product or service). These two forms of knowledge jointly form systems of knowledge, which underpin matrix of possible product-market expansion paths. New product introductions that follow from this matrix are termed product sequencing. Organizational knowledge is accumulated through systems of learning that consist of incremental learning and step function learning. Incremental learning builds upon existing knowledge but does not significantly depart from it. It can underpin new product generations (such as new versions of Sony Discman) and also support new configurations of activities due to the enhanced integrative knowledge. In contrast with incremental learning step function learning involves fundamental changes to core or integrative knowledge. As such it presents difficult challenge for organizations. It requires ongoing feedback about products, markets and technologies that points to need for new knowledge. Benchmarking provides such feedback, and can in the case of wide disparities of product portfolio of the firm relative to its competitors signal need for major rethinking of integrative mechanisms.

The systems in knowledge and portfolio of products, along with the combination of two types of learning provide 'real options' for the firm (Brown and Eisenhardt, 1997). Firms will generally start from different levels of knowledge and with different product portfolios, and will evolve different configurations of activities, capabilities and products. Evolution is path dependent, i.e. newly developed knowledge will be affected by previous level and content of knowledge. Success with particular generation of products will generate richer set of viable real options and platforms upon which to build potentially successful future product generations than failure. In other words, success breeds success, and superior systems of learning, that support continued successful product sequencing can form basis of sustainable competitive advantage.

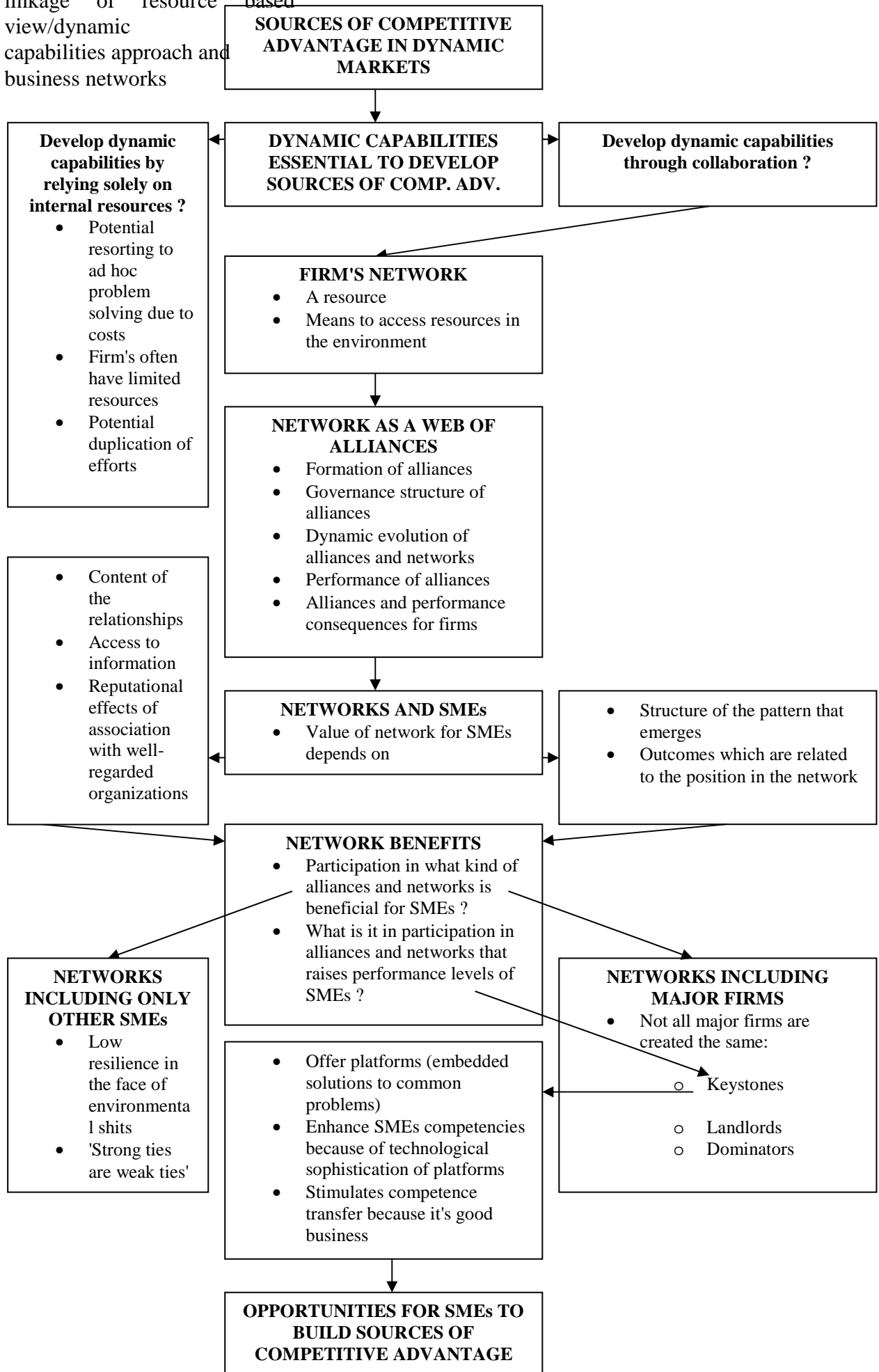
4. DYNAMIC CAPABILITIES IN THE NETWORKED ENVIRONMENTS

In previous paragraphs I presented a view that competitive advantage and consequently performance of firms rests on organizational processes. Scholars have yet to come to the consensus on whether organizational processes by themselves or resource configurations that they create constitute sources of competitive advantage, however there seems to be an agreement that sets of particular organizational processes, termed dynamic capabilities, are essential for development of competitive advantage in dynamic markets.

The important question that remains though is whether firms in dynamic markets should develop their competitive advantage by relying solely on their internal resources or should they try to access resources from the environment. Winter (2003) pointed out that development of dynamic capabilities is often a costly endeavor and that firms may often resort to ad hoc problem solving. Ad hoc problem solving is usually sufficient for the firms to 'make a living', however it doesn't enable firms to develop and sustain competitive advantage in dynamic markets. Furthermore, firms often have limited internal managerial and technological capacity to develop their capabilities to the level needed for viable participation in dynamic markets. Solely internal development of knowledge needed to support dynamic capabilities may result in duplication of efforts, as firms may end up developing knowledge already present in their environment.

This list of potential problems associated with developing capabilities by relying solely on internal resources is by no means exhaustive, however it is presented to suggest that it may be worthwhile for firms to consider establishment of formal and informal linkages with organizations and individuals in their environment. The rationale is that although any cooperation has several risks associated with it (appropriation of knowledge, opportunistic behavior, lock-in in unproductive arrangements etc.), it is reasonable to believe that benefits flowing from access to pool of external knowledge, competencies and resources can exceed costs of cooperation. To assess this idea, we first need to describe conceptual linkage between resource based view of the firm and business networks. Figure 3 presents logical flow of the conceptual linkage that I am presenting in this section.

Figure 3: The conceptual linkage of resource based view/dynamic capabilities approach and business networks



Gulati, Nohria and Zaheer (2000) argue that a firm's network of formal and informal linkages can be thought of as an inimitable valuable resource by itself, and also a means to access valuable inimitable resources and capabilities in firm's environment. In that former sense network resources are similar to notion of social capital of individuals.

The key idea underlying notion of network resources as an inimitable resource is that the structural pattern of a firm's relationships is unique and has the potential to confer competitive advantage upon a firm. Study by Zaheer and Zaheer (1997) provides an example of network resource that is a source of competitive advantage. They conceptualize firm capabilities of alertness and responsiveness in the context of information networks in the global currency trading industry. Firms have been found to be highly alert when they create and utilize wide-ranging information networks by means of numerous weak ties, high centrality (location in the center of network) and wide geographical scope. Together with responsiveness, this capability translates into superior performance. The membership of a firm's network is nearly always idiosyncratic as well (firms differ in sets of networks they are involved in and in characteristics of their involvement). The existing partner firms can both restrict and enlarge the opportunity set of future relationships available to the focal firm. For non-participants or new entrants particular network provides no information at all, which may lock them out of new opportunities.

Scholars have also identified capability that firms possess to manage the firm's network. Kale, Singh and Perlmutter (2000) refer to it as a firm's alliance capability. Firm's alliances are complex organizational arrangements, therefore managing the network involves using appropriate governance mechanisms, developing inter-firm knowledge sharing routines, making appropriate relationship-specific investments, and initiating necessary changes to the partnership as it evolves (Dyer and Singh, 1998). The possession of alliance formation capabilities can therefore be a significant resource for firms due to the managerial challenges associated with forming and managing networks of alliances (or even one alliance).

Networks are essentially webs of dyadic alliances and linkages, and are influenced by the characteristics of those alliances. Conversely, dyadic alliances are influenced by networks in which they are embedded. Hence, one needs to take into account both concepts when addressing formation of alliances and their influence on competitive advantage and performance of firms. Gulati (1998) provided the most comprehensive review of alliances and networks to date, and discussion in following paragraphs is based on his contribution.

Gulati (1998) defines strategic alliances as “voluntary arrangements between firms involving exchange, sharing or co-development of products, technologies and services”. He then goes on to address alliances from viewpoint of strategy and performance. From strategic standpoint, some of key aspect of behaviors could be understood by looking at the sequence of events in alliances: it includes the decision to enter an alliance, the choice of an appropriate partner, the choice of structure for the alliance and the dynamic evolution of the alliance as

the relationship develops over time. While not all alliances necessarily pass through this sequence of events, key decisions to be made concerning these events are involved in all alliances. Following this sequence are the relevant research questions:

- Which firms enter alliances and whom do they choose as partners?
- What type of contracts do firms use to formalize the alliance?
- How do the alliance and partners' participation evolve over time?

A second important issue for alliances is their performance consequences, both in terms of performance of alliance relationship itself and the performance of firms entering alliances. Two research questions focus on the performance issue:

- What factors influence the success of alliances?
- What is the effect of alliances on the performance of firms entering them?

I'm going to briefly summarize Gulati's treatment of first three research questions and then focus on the last two questions.

4.1 Formation of alliances

In a review of theoretical explanations for the formation of joint ventures, Kogut (1988a) identified three main groups of motivations that can be applied to other types of alliances as well:

- Desire to reduce transaction costs: resulting from small numbers bargaining involved in isolated transactions
- Strategic behavior: firms try to enhance their competitive positioning or market power
- Quest for organizational knowledge or learning: it results when one or both parties want to acquire some critical knowledge from the other or one partner wants to maintain its capability while seeking another firm's knowledge

A second question associated with alliance behavior is with whom firms partner. A firm's decision to enter into an alliance is closely linked with its choice of an appropriate partner and may even be determined by that partner's availability. Strategic perspective, one of the more influential views on choice of partners suggests that firms ally with those partners with whom they share the greatest interdependence (a situation when one firm has resources or capabilities beneficial but not possessed by the other and vice versa).

However, an account of alliance formation that focuses only on interdependence ignores how firms learn about new alliance opportunities and overcome fears associated with partnerships.

Firms entering alliances namely face significant moral hazard concerns due to the unpredictability of behavior of their partners and potential costs of their opportunistic behavior. To build ties that effectively address their needs while minimizing the risks posed by such concerns, organizations must be aware of the existence of their potential partners and needs and requirements of these partners. Faced with uncertainty about a partner, firms often resort to their existing networks for information, thereby lowering search costs and costs of potential opportunism.

Embeddedness in social networks influences the opportunity set of viable alliances firms perceive. On the other hand, networks place a constraint on the extent to which potential partners are aware of a firm and on the awareness on the side of the firm of potential partners. Further, embeddedness view suggests that mutual economic advantage is necessary, but not sufficient condition for the formation of an alliance. It is the firm's social connections that help it identify new alliance opportunities and choose specific partners that possess desired complementary assets or competencies.

4.2 Governance structure of alliances

While alliances may be considered a distinct form of governance that is different from markets or hierarchical organizations, there is also variation in the formal structure of alliances themselves. Prior research has distinguished among alliance structures in terms of the degree of hierarchical elements they embody and of the extent to which they replicate the control and coordination features associated with organizations, which are considered to be at the high end of the spectrum. At one end of that spectrum are joint ventures, in which partners share equity and who most closely resemble organizations, whereas at the other end of the spectrum are alliances with no equity sharing that have little hierarchical elements built into them.

Scholars have long viewed structure as a mechanism to manage uncertainty. Prediction was that the greater the appropriation concerns, the more hierarchical the governance structure for organizing the alliance are likely to be. However, an important shortcoming of early approaches was that they implicitly treated alliances as discrete independent events, when in fact firms may have a long history with each other through entering alliances over several years. The approach is therefore static; its unit of analysis is each transaction and not the relationship, thus it ignores possibility of processes emerging from prior interactions between partners. Furthermore, if embeddedness in social networks is also considered, important implication of enhanced trust as a governing mechanism arises.

4.3 Dynamic evolution of alliances and networks

To build upon issue of history of alliancing between two firms, dynamic processes that underlie development of individual alliances can be considered. Such arrangements can be transformed significantly beyond their original design once they are under way. The varying evolutionary paths can have significant consequences for performance of alliances. Understanding the evolution of alliances can therefore provide critical insights into how they can be better managed. Scholars have devoted studies to understanding factors that influence evolution of alliances and possible stages through which alliances may proceed.

One of the factors studied has been the role of the initial conditions in subsequent development of alliances. An idea has been introduced by Gulati et al. (1994) that each partners' comprehension of an alliance's pay-offs is important for understanding the incentives to cooperate and for realizing possible ways in which each partner may influence alliance's outcomes. Another suggestion was that the opportunity set of each firm outside of alliance affects firms' behavior in alliances. Scholars have also looked at the combination of initial conditions and adaptive processes on the ultimate behavior and outcomes of alliances (Hamel et al., 1989). Evidence suggests that while initial conditions such as the objectives of partners, their learning processes and the nature of environmental and inter-organizational context do influence development of alliances, the evolution of alliances may consist of discrete stages that occur due to the discrete changes in the environment. While the focus of these investigations has been dyadic level of alliances, similar behavior processes can be present in networks. However, they remain to be explored. So far scholars have suggested that clusters of firms of dense ties may pursue collective strategies, leading to new forms of competition among networks (Gomes-Casseres, 1994).

4.4 Performance of alliances

Performance of alliances has received less attention due to the research obstacles, which include measuring alliance performance and challenges in collecting rich data. As a result it remains a relatively under-explored area. Several studies have reported high failure rate of alliances and several practitioner oriented scholars have sought to identify formula for success of alliances (e.g. Kanter, 1989). These scholars suggested following elements as enhancing the probability of success of alliances:

- Flexibility in management of the alliance
- Building trust with partners
- Regular information exchange with partners
- Constructive management of conflict
- Continuity of personnel responsible for interfacing between firms
- Management of partner expectations

These studies have approached performance of alliances by examining their termination. While these studies have provided relevant insights into termination of alliances, their importance for understanding the performance of alliances is limited for two reasons: first, studying failure of alliances by looking at termination fails to distinguish between intended and untimely termination, and second, their studies implicitly consider performance as a digital, either-or event, which is clearly not the case and more gradation is needed.

One of the most challenging obstacles to studying performance and also one of the problems with many studies reporting high failure rate of alliances is performance measurement itself. Given the multiple objectives of many alliances, performance can be difficult to measure with financial outcomes. In most cases such measures don't even exist. Furthermore, performance in dyadic relationships is often asymmetric: one firm achieves its objectives while the other fails to do so. Despite these measurement obstacles researchers have gone beyond the notion that equates failure of alliance with its termination and tried to uncover some of the factors associated with the success of alliances.

While there have been advances in assessing the performance of alliances, few of these efforts have considered the impact of social networks, in which firms are placed, on the relative performance of alliances. Once we acknowledge for embeddedness of firms in social networks, we can examine whether such alliances that are embedded to a greater or lesser degree in various networks perform better or worse than others and why.

The extent to which an alliance is embedded in social network is likely to influence its performance for several reasons. By being embedded in a network partnering firms are likely to have greater confidence and trust in each other, both because they have more information and because network acts as a natural deterrent to opportunistic behavior due to the effects on reputation. There is some evidence that alliances with embedded ties may perform better or last longer than others. Kogut (1989) found that alliances between firms with a prior history of ties were less likely to terminate Levinthal and Fichman (1988) found that there may be attachments among firms that lead to the persistence of such ties. Such attachments are conditional on social structure in which firms are embedded and include individual attachments resulting from continuing relationships of individuals in networks, and structural attachments arising from history of relationships between the organizations.

As firms have entered in growing number of alliances, major firms such as GE, Microsoft, Hewlett Packard and IBM have found themselves in hundreds of alliances. This has resulted in new issues arising from managing a portfolio of alliances. This opens up questions of cooperative capabilities of firms. Evidence suggests that there may be systematic differences in the cooperative capabilities that firms build up as they have more experience with alliances. This poses question what such capabilities are and how firms might develop them. At least some of these capabilities include identifying valuable alliance opportunities and good partners, using appropriate governance mechanisms, developing inter-firm knowledge sharing

routines, making relationship-specific investments and initiating necessary changes to partnerships (Doz, 1996; Dyer and Singh, 1998). Dedicated alliance function that some firms developed has been associated with superior performance (Kale, Dyer and Singh, 2002). The fact that the firm enters wide array of alliances suggests that it has to simultaneously manage its portfolio and address conflicting demands from different alliance partners. Furthermore, if the firm is at the center of a network it must pay particular attention to a series of strategic and organizational issues (Lorenzoni and Baden-Fuller, 1995).

4.5 Alliances and performance consequences for firms

Since many other activities besides alliances can also influence the performance of firms, it can be difficult to empirically link the alliance activity of firms with their performance. As a result, scholars have looked at a variety of ways to test this relationship.

Several researchers have conducted event study analyses of the stock market effects on alliance announcements (e.g. Koh and Venkataraman, 1991, Kale, Dyer and Singh, 2002). As much as the stock market reactions predict future outcomes of alliances, results of these studies provide mixed evidence of the beneficial effects of alliances. Another approach addresses aggregate influence of alliances on firm performance by examining the relationship between the extent to which firms are embedded in alliances and the likelihood of their survival. Some studies report that alliances on which firm's survival may depend have been alliances with vertical suppliers and with key institutions in the environment. The results of those studies suggest, that such ties are generally beneficial in enhancing survival chances. This may not always be the case and numerous factors that may alter this relationship have been proposed (Singh and Mitchell, 1996).

4.6 Networks and SMEs

Since the focal firm population in my study is small and medium-sized enterprises (SMEs), it is worth examining specifics of SMEs operating in networked environments. Hoang and Antoncic (2003) provided comprehensive review of network-based research in entrepreneurship which they organized according to the three essential components of networks:

- The content of the relationships
- The governance of these relationships
- The structure of pattern that emerges from the crosscutting ties

I will discuss the two components more relevant for my purposes, i.e. the content of the relationships and the structure of pattern that emerges from the crosscutting ties. For the

purpose of adherence to Hoang and Antoncic's terminology, by discussing entrepreneurial activity and entrepreneurs I will also refer to SMEs.

With respect to network content interpersonal and inter-organizational relationships are viewed as the means through which actors gain access to a variety of resources held by other actors. A key benefit of networks for the entrepreneurial process is the access they provide to information and advice. The reliance on networks is not constrained to the start-up stage. Entrepreneurs continue to rely on networks for business information, advice, and problem solving, with some contacts providing multiple resources. Relationships can also have reputational or signaling content. Entrepreneurial activity takes place under uncertain and dynamic conditions and entrepreneurs seek to reduce this perceived risk by associating with, or gaining explicit certification from well-regarded individuals and organizations. Positive perceptions based on a firm's network linkages may in turn lead to subsequent beneficial resource exchanges. Another relevant construct is network structure, defined as the pattern of relationships that are engendered from the direct and indirect ties between actors. General proposition is that differential network positioning has an important impact on resource flows and consequentially on the outcomes.

More than ten years before Gulati's treatment of alliances as embedded in networks Aldrich and Zimmer (1986) argued that the entrepreneur is embedded in a social network that plays a critical role in the entrepreneurial process. Interpersonal and inter-organizational linkages are seen as the channel through which actors gain access to a variety of resources held by other subjects in the network. A key benefit of networks is the access they provide to information and advice. The most relevant point about entrepreneurs' membership of networks is that they seek reduction of risk associated with them by associating with well-regarded organizations and individuals, which may in turn lead to improved access to resources and capabilities. In support of this, Stuart et al. (1999) found that private biotechnology firms with prominent strategic alliance partners were able to go public faster and at higher market valuation.

Research also suggests that there are growth benefits to inter-organizational linkages for entrepreneurial firms. Stearns (1996) studied strategic alliances among a sample of high-tech firms and found that among new firms (less than seven years old), the presence of a foreign strategic partner was associated with higher rates of growth. Additionally, Zhao and Aram (1995) found, in a sample of Chinese entrepreneurs, that the intense use of networks was associated with high growth firms in contrast to low-growth firms. However, Hoang and Antoncic mention number of studies that found null or equivocal results. Presence of benefits for SMEs that arise from alliances therefore has to be examined further in future research to provide more conclusive answers.

Literature suggests that there may be performance benefits to SMEs actively participating in alliances and networks. Out of this suggestion, two questions arise: first, participation in what

kind of alliances and networks is beneficial for SMEs, and second, what is it about participation in alliances and networks that raises performance levels of SMEs.

In order to examine the first question, we need to present some evidence on benefits a particular type of networks confers on its members. Powell et al. (1996) analyzed research oriented SMEs in biotech industry and found that the locus of learning in that industry is located in networks of firms, and that higher centrality was associated with higher performance. Their findings are important and have two implications: that the network a firm finds itself in does matter (as learning opportunities for a firm depend on knowledge and capabilities of network members), and that positioning in the network matters as well. Iansiti and Levien (2004b) developed these notions further. They analyzed productivity in the software, biotech and the internet industries from 1995 to 2002. They found that cumulative returns on invested capital were positive for the software industry, while for biotech industry were slightly negative and for internet industry they were significantly negative. Furthermore, they observed constant gap in productivity of the software and biotech industries, whereas internet industry experienced sharp drop in return on invested capital after year 1996. Afuah (2000) pointed out that firm's performance can deteriorate if technological change renders capabilities of its coopetitors (suppliers, complementors, partners and customers) obsolete. Therefore it is important that a firm tries to identify and enter networks whose members developed capabilities to withstand technological and other environmental shifts.

It seems reasonable to believe that many networks consisting solely of SMEs are likely not to meet those criteria. Again we can invoke Winter's argument that firms, including SMEs, often have a tendency to resort to ad hoc problem solving, which in time results in inadequately developed dynamic capabilities. Additionally, by partnering with SMEs similar to them firms might fall under 'strong ties are weak ties' situation. The rationale is that actors that have strong ties among themselves are likely to possess similar levels of capabilities and resources (including network resources). Therefore they don't enhance each other's sources of competitive advantage and that makes strong ties weak in terms of value.

Preceding discussion suggests that it may be valuable for firms to try to enter networks, whose members include major firms, who tend to possess superior resources and capabilities. Three common objections to such intention might be that first, major firms are not interested in building business ties with SMEs who can not bring any significant contribution to the table, second, that major firms would dominate such networks at the expense of SMEs' performance, and third, that superior resources and capabilities of major firms would not be of much use to SMEs. I will argue that these scenarios are not necessary in all situations and that there is potential to improve SMEs' performance by participating in business networks characterized by presence of major firms.

It has been argued throughout this section that firms operate in networked environment. To help answer the questions posed above, we need to gain more insight into how is such

networked environment structured and how it functions. In their innovative and persuasive treatment of modern business environment, Iansiti and Levien (2004a, 2004b) suggest that business networks are analogous to biological ecosystems in that they both include loosely connected participants, who to a greater or lesser extent share a common fate (vivid example of common fate was the joint downfall of hundreds of dotcom companies after the implosion of the internet bubble). What is more striking though is that both business networks and ecosystems tend to be asymmetrically distributed, i.e. that some actors tend to have significantly more ties than other actors. These actors play the role of the hub, and Iansiti and Levien demonstrate that activities of hubs have significant impact on health of the ecosystem or business network as a whole. They classify behavior of firms that occupy hubs in business networks (Iansiti and Levien term them as business ecosystems) as keystone, landlord and dominator behavior.

Firms that act as keystones improve health of the whole ecosystem by providing stable and predictable set of common assets that other firms use to develop their own offerings. Iansiti and Levien suggest that ecosystem's health can be assessed on three dimensions:

- Productivity
- Robustness
- Niche creation

Keystone players increase productivity of the ecosystem by simplifying complex task of connecting network participants to one another by offering common platforms (typical examples are Microsoft's operating systems and tools and Wal-Marts procurement system). They also contribute to increased robustness of the ecosystem by consistently incorporating technological innovations in platforms and providing reliable points of reference for other participants. Finally, keystone players encourage niche creation by offering their innovative technologies to a variety of firms and organizations. Keystone players employ strategies of creating and sharing value with other ecosystem members not out of altruism but because it is good business. The reason is that platforms are only effective if they are widely used, due to the economic phenomena of network externalities and lock-in effect. Network externalities is the term to describe a property of a certain product, service or technology of becoming more valuable as more people start to use it. Lock-in effect occurs when scale of users and complementors of particular technology exceeds critical mass and switching costs significantly exceed switching benefits.

By applying what Iansiti and Levien term landlord strategy, hub firms try to extract as much value from an ecosystem as possible without trying to control it. These firms recognize that networks have high potential to create value, however they capture too much of it for themselves. Landlord strategy is always dangerous and ecosystems characterized by the presence of landlords are likely to experience deteriorating health. Dominator firms employ strategies that have elements of both keystone and landlord strategies. Goal of a dominator

strategy is to control both creation and capture of the value in an ecosystem. These firms have tendencies to vertically integrate, i.e. try to take over their ecosystem. Like landlords dominators have the potential to do damage to their ecosystems, however the dynamics can be different. In terms of impact on productivity, landlords drain incentives to innovate from the ecosystem while failing to create any themselves. Dominators differ in that they take it up to themselves to deliver innovations. The productivity of an ecosystem is then determined by dominator's internal R&D capacity. Landlords are not concerned with development of stable core that other ecosystem members can build on, whereas dominators are. However, in time lack of diversity in ecosystems characterized by the presence of dominators makes those ecosystems fragile and less resilient in the face of technological shifts. Landlords stifle niche creation to an even larger extent than dominators, since they extract so much value out of their ecosystem that they impoverish ecosystem members, who can not build meaningful new businesses and pursue new niches.

To illustrate concepts of keystone, landlord and dominator behavior it is worth examining strategies of some well-known firms that occupy (or occupied) hub positions in their respective ecosystems. Microsoft, eBay and Wal-Mart have been pursuing keystone strategies, and by doing that developed productive, resilient and diverse ecosystems around themselves. Microsoft is perhaps the most persuasive case in point. It has developed operating system and development tools that are used by five million software developers, and stimulated formation of an ecosystem consisting of 40.000 partner firms worldwide (Iansiti, Levien, 2004b). Since software industry is highly fragmented, Microsoft carefully supports health of each of its ecosystem's domains (systems integrators, independent software vendors, development service companies etc.) in awareness that the health of the ecosystem depends on health of each of its domains. Microsoft contrary to the common belief constitutes only a small portion of the software industry, however through its platforms contributes to a significant proportion of value created. Another firm that developed a platform that became core of a large community is eBay, the online auction provider. Through improvement in economic efficiency of transactions due to their high transparency, eBay created large value for the ecosystem. It also stimulates niche creation by enabling trading of virtually any type of goods. Wal-Mart also builds its own competitive advantage and competitive advantage of its suppliers by offering them access to the procurement system, which provides real-time information on sales and inventory in Wal-Mart's stores. Such information is crucial for superior supply chain management of Wal-Mart's ecosystem and consequential unrivaled cost efficiency.

Widely known example of landlord strategy is Enron. Although it followed similar path as eBay and established itself as a middleman, it aimed to capture as much value as possible for itself. Its traders executed strategies that generated losses for participating parties without generating any new value. In the end value generating capacity of the ecosystem that formed around Enron was so low that it eventually led to the downfall of the company. An example of classical dominator is IBM in the 1970s and 1980s. It was a vertically integrated company

that controlled more than 80% of value generated in its ecosystem. It relied on its extensive internal knowledge and R&D capability. However, in 1990s IBM's competitive position significantly eroded due to the success of more open Wintel standard, i.e. personal computers running on Intel processors and Windows operating system. IBM recently made some steps toward changing its strategy in direction of keystone strategy, one of them being partnership with Red Hat software. That partnership made the Linux operating system integral to IBM strategy and IBM a keystone for the Linux community.

Examples described above point out that not all major companies are created the same, and that there are differences in their strategies with respect to value creation and value sharing. This assertion has important implications for strategy SMEs should pursue. As Gulati (1999) and Dyer and Singh (1998) point out, membership in networks confers upon firms access to resources and competencies of other network members. Since earlier discussion suggests that networks most likely to offer the most opportunities for niche creation (natural strategic direction for SMEs) are those characterized by major firms employing keystone strategy, SMEs could improve their resource and competence endowment and potentially raise level of performance by joining such networks. Furthermore, since position in the network matters, SMEs would likely benefit from network position close to the keystone firms, which could be achieved by actively cultivating relationships with them.

However, cultivation of such relationships is unlikely to generate significant benefits for SMEs per se. Rather exploration should be complemented by exploitation. By exploitation I mean active integration of accessible competencies of keystone players, which tend to develop through internal activities of keystone firms and activities of other members of an ecosystem. Iansiti and Levien (2004b) define platforms as “set of solutions to common problems”. If we follow their definition we see that core competencies of keystone firms often involve the capacity to set standards by offering solutions that become building blocks of the offerings of ecosystem's members. Keystone firms make platforms available as widely as possible, as that increases their value. By accessing those platforms SMEs effectively integrate keystone firms' competencies as they are embodied in platform solutions. The exercise of platform integration has the potential to improve level of SMEs' competencies as it demands at least partial understanding of technologies embodied in the platforms. As platforms generally embody the latest technologies, platform integration exercise is in fact also competence developing exercise. However, improved competencies and integrated platforms can fully benefit SMEs only if SMEs develop distinctive offerings on the basis of the platforms. Limited resource endowments allow SMEs to focus on a relatively narrow niche, and key to success in niche markets is differentiation. Process of integration of internal competencies of SMEs, instrumental in their development of offerings, with external competencies that define shape of building blocks in ecosystems, ultimately rests upon dynamic capabilities of SMEs. To explore this issue in more detail I now turn to examination of empirical literature on dynamic capabilities to gain some insight into how such process might look like.

5. EMPIRICAL STUDIES ON DYNAMIC CAPABILITIES – A REVIEW

Certain authors have criticized dynamic capabilities approach on the grounds of tautology (Priem and Butler, 2001). They argued that the concept uses words to merely repeat what has already been stated ('ability to develop capability'). Eisenhardt and Martin (2000) addressed that criticism by pointing out that there are extensive empirical streams on organizational processes that constitute dynamic capabilities. They categorize them in four categories:

- Dynamic capabilities that integrate resources and capabilities
- Dynamic capabilities aimed at creation of new resources
- Dynamic capabilities that support resource allocation routines
- Dynamic capabilities that support release of resources routines

Integrative dynamic capabilities include integration of both internal and external resources and capabilities. One of dynamic capabilities that involves integration primarily of internal resources is product development. Brown and Eisenhardt (1997) studied how organizations engage in continuous change in the context of multiple product innovation. Their rationale was that organization and strategy research have become locked in punctuated equilibrium view that emphasized radical change at the expense of understanding the kind of rapid, continuous change that is more closely representative of common managerial experience. Comparison of firms successful and less successful in multiple product innovation revealed that:

- Successful multiple product innovation blended limited structure around responsibilities and priorities with extensive communication and design freedom to create improvisation within current projects
- Successful firms relied on wide variety of low cost probes into the future, including experimental products, prototypes and strategic alliances
- Successful firms linked the present and future together through rhythmic, time-paced transition processes.

These practices jointly formed a dynamic capability for creating frequent, relentless and effective change. Henderson and Cockburn (1994) studied another type of integrative dynamic capability, R&D activities. They explored organizational competencies in the context of pharmaceutical research. They distinguished between component and architectural competence, and found that two of the measures they constructed to measure architectural competence (relevance of publication records as criteria for promotion and existence of committees rather than a single person in charge for research resources allocation) were significantly correlated with the research productivity. Small changes in the ways in which research was managed inside the firm appeared to have had major implications for its productivity.

Authors offered four explanations for large and persisting differences in productivity of research:

- Capabilities measured are inherently inimitable (systems that support research routines are so complex that they are difficult to observe and replicate)
- Agency problems: failures of market for corporate control may have enabled less productive firms to continue running inefficient research organizations
- Measures reflect quality of scientists in the firms rather than any fundamental difference in the quality of the information flow within the organization
- Measure of innovative output proposed by authors is not capturing all the relevant dimensions of innovative success

Henderson and Cockburn's research supports the view that the ability to integrate knowledge both across the boundaries of the firm and across disciplines and product areas within the firm can constitute an important source of competitive advantage. Their approach builds on important previous contribution by Henderson and Clark (1990) on architectural innovation and development of integrative function. They also suggest that the ability to access and integrate knowledge across the boundaries of the firm may confer competitive advantage upon a firm. Dyer and Singh (1998) address this issue in detail. They present relational view that suggests that firm's critical resources may span firm boundaries and may be embedded in inter-firm resources and routines. According to Dyer and Singh, there are four potential sources of inter-organizational competitive advantage:

- Relationship specific assets
- Knowledge sharing routines
- Complementary resources/capabilities
- Effective governance

Their contribution is interesting in that they identify certain inter-firm combinations of resources as both idiosyncratic and indivisible. They present example of Visa credit card and cite 23.000 participating banks as an example of alliance partners jointly creating indivisible assets that help generate returns for alliance partners. In particular, Visa brand name and distribution network can be considered idiosyncratic. Dyer and Singh also identify example of inter-firm combination of resources that coevolved over time (Fuji and Xerox). They identify as potentially problematic issue loss of flexibility, as firms can not control and redeploy resources on their own in such settings. Authors stop at the point of describing potential for combinations of resources and their subsequent co-evolution, leaving room for study of how are these combinations reconfigured, in other words, what kind of dynamic capabilities do alliance partners develop and deploy to reconfigure combinations of resources and manage their co-evolution.

Cockburn et al. (2000) took some steps in that direction. They examined science-driven drug discovery in the pharmaceutical industry. Research in that industry was prior to late 1970s primarily conducted through a process of random search. From the late 1970s on, firms began to respond to the acceleration in the growth of publicly available biological knowledge by adopting a new mode of research, science driven drug discovery. Those firms adopting the new techniques appeared to have been significantly more productive, and diffusion across the industry was surprisingly slow. Authors found that adoption of new techniques was driven by initial conditions, time-varying internal and external conditions and convergence (firms positioned least favorably adopted new techniques most aggressively). Furthermore they found that while initial conditions were critical, productivity depended also on managers' sensitivity to internal and environmental cues. The origins of competitive advantage may therefore lie in the ability to identify and respond to environmental cues well in advance of observing performance related pay-offs. However, authors' contribution fails to provide convincing explanation for how was such ability developed (they acknowledge that, asking 'were the more productive firms lucky or smart'). Therefore Cockburn et al.'s contribution was beneficial in the sense that they opened stage for further research by indicating that how firms organize ex ante to exploit new market opportunities needs to be explored.

Firms need to have appropriate knowledge to perceive of opportunities in their environment and muster internal and external resources to exploit those opportunities. Brusoni et al. (2001) observed that some multi-technology firms assemble knowledge in excess of what they need for what they make. They contended that firms need this additional knowledge to cope with imbalances caused by uneven rates of development in the technologies on which they rely and to cope with unpredictable product-level interdependencies. By knowing more than they need multi-technology firms can coordinate loosely coupled networks of suppliers of equipment, components and specialized knowledge and maintain a capability for systems integration. Networks enable multi-technology firms to benefit from advantages of both integration and specialization. In addition to possessing systems integration capability such firms also develop capabilities that support establishing and tightening links with outside sources. The latter capability could be termed alliance capability.

Kale et al. (2002) examined what factors influenced firms' ability to build alliance capability and enjoy greater alliance success, where firm level alliance success was measured in two ways: a) abnormal stock market gains following alliance announcements and b) managerial assessments of long term alliance performance. They found that greater alliance experience and creation of dedicated alliance function (a body established to strategically coordinate alliance activity and capture/disseminate alliance related knowledge) were associated with greater alliance success. Authors also found positive correlation between stock market-based measures of alliance success and alliance success measured through managerial assessments. The most relevant finding, however, was that firm's investment in dedicated alliance function was a more significant predictor of the firm's overall alliance success than its alliance experience. Having such a function can improve firms' alliance capabilities so as to be able to

identify appropriate alliance partners, screen them more effectively, attract those alliance partners that are stronger and more compatible etc. Most firms in Kale et al.'s sample seemed to have been aware of potential benefits of development of alliance capability, as they performed activities for knowledge capture and codification. However, creating such a function entails risk in that it requires a significant investment in human and other resources that pays off only if firms are large enough or enter into enough alliances to justify and cover the costs.

Research and development (R&D) is a typical dynamic capability in the sense that it creates resources (new knowledge, technologies etc.) that can function as a source of competitive advantage. Helfat (1997) examined dynamic R&D capabilities by investigating complementary know-how and other assets in the context of changing conditions in the US petroleum industry during the 1970s and early 1980s. Her analysis suggested that, in response to rising oil prices, firms with larger amounts of complementary technological knowledge and physical assets also undertook larger amounts of R&D of coal conversion. This study presented empirical value of complementary resources for dynamic capabilities and represents an extension of Teece (1997) et al.'s discussion of complementary assets.

Pisano (1994) used data on 23 process development projects in pharmaceutical industry to explore the broader issue of how organizations create, implement and replicate new routines. Data indicated that in chemical-based pharmaceuticals – an environment characterized by deep theoretical and practical knowledge on the process technology – more emphasis on laboratory experimentation (learning-before-doing) was associated with more rapid development. In contrast, in biotech based pharmaceuticals – an environment in which process technology is often characterized as being more of an art than science – a greater emphasis on laboratory experimentation did not seem to shorten process development lead times. Pisano concluded that different approaches to learning and creation of new resources/routines are required in different environments. Also, different resources may be critical to competitive advantage in different environments. In environments characterized by rich scientific knowledge bases, resources supporting research may be critical; in environments where technology is more art than science, resources that support learning-by-doing capabilities are likely to be valuable.

Resource allocation routines (Burgelman, 1994) and transfer processes including routines for replication and brokering (Hansen, 1999; Hargadon and Sutton, 1997) are examples of dynamic capabilities that focus on reconfiguration. In multi-business firms, corporate divisions might be envisaged as combinations of capabilities and product-market areas of responsibility that may be recombined in various ways. Galunic and Eisenhardt (2001) suggested organizing recombinative processes in multi-business firms in dynamic communities, organizational forms consisting of diverse and quasi independent divisions that share identity and values and are guided by social as well as economic rules. Finally, Sull

(1999) suggested that there are dynamic capabilities that release resources: giving up resource combinations that no longer provide competitive advantage is a crucial ability for a firm.

Some dynamic capabilities may also be combinations of other dynamic capabilities. Dynamic capabilities presented by Brown and Eisenhardt (1997) are a case in point. Another example has been provided by McGrath et al. (1996). In their comprehensive treatment of innovation capability they identified four antecedents that are necessary precursors for a firm to capture rents from innovation:

- Causal understanding
- Innovation team proficiency
- Emergence & mobilization of new competencies
- Creation of competitive advantage

Authors argue that before a firm may expect rents from an innovation, it must establish a distinctive competitive advantage, otherwise rents will be appropriated by rival firms. To create competitive advantage, it has to be able to demonstrate successful and reliable achievement of its business objectives, which would suggest it has created new competencies. Such achievements will be difficult if the innovation team can not reach high level of proficiency in task to be completed. Proficiency will be hampered unless the team comprehends the nature of the challenges facing it. Interesting contribution of the authors is that they suggest that the ability of a project team to converge on project objectives can be used as a leading indicator of emerging competence. Even if objectives are altered during course of the project, it shows that competencies different from the ones already in place are emerging, as team must accumulate some new knowledge before it can set new objectives. Authors point out that these findings imply that process counts – team processes of learning and of developing proficiency fundamentally shape the economic outcomes of an innovation attempt.

Several authors have emphasized role of managerial perception in firms' reactions to environmental shifts. Managers' mental models also play role with respect to development and deployment of dynamic capabilities. Tripsas and Gavetti (2000) showed through a case study of Polaroid that limited adaptability and deployment of dynamic capabilities may occur due to the barriers in managerial cognition. Authors examined relationship between Polaroid's managers' understanding of the world and accumulation of organizational capabilities during shift from analog to digital imaging. They found that Polaroid had little problem overcoming the path dependencies normally associated with knowledge evolution (Teece et al., 1997). It was able to develop leading-edge capabilities in a broad array of technological areas related to digital imaging.

It was consistent with top management's belief that commercial success could only come through major research projects. In other words, Polaroid didn't experience major difficulties

searching in a radically new technological trajectory and developing new technological competencies, largely due to the consistency of this purely exploratory behavior with the belief in the primacy of technology. Second commonly held belief was that Polaroid could not make money on hardware, but only on consumables (the razor/blades model); that seems to have been main source of its inertia. At the beginning of 1990s, when the market for digital imaging applications slowly started to emerge, senior managers strongly discouraged R&D efforts the were not consistent with the traditional business model, despite ongoing efforts from newly hired members of the Electronic Imaging Division to convince them otherwise. As the market for digital imaging was developing at high pace, Polaroid's competitive position was eroding due to unwillingness on the part of top management to deploy accumulated dynamic capabilities in that field to develop and market digital imaging products. Authors presented the story of Polaroid to point out that to fully understand evolution of organizational capabilities the role of managerial cognitive representations should not be neglected.

Previously mentioned study by Henderson and Cockburn (1994) was one of the first efforts to measure importance of organizational competencies. The authors reported several obstacles that accompanied their measurement approaches. These obstacles can also be observed in attempts to measure dynamic capabilities. Some scholars have criticized dynamic capabilities concept on the grounds of operational limitations (Williamson, 1999). However, recently researchers have made efforts to tackle problem of measurement difficulties by constructing measures of dynamic capabilities. Zott (2003) explored how dynamic capabilities of firms may be linked to the differential firm performance within an industry. Author proposed three performance-relevant attributes of dynamic capabilities (timing, cost and learning of resource deployment) and developed appropriate measures. Conclusion of the study, based on a computer simulation, was that the effects of timing, cost and learning significantly contribute to intra-industry differences in performance. Macher and Mowery (2001) examined the role of the R&D organization and information technology practices for problem solving and learning-based improvement in innovation in semiconductor manufacturing. They derived models of the rate of improvement in manufacturing yield and cycle time, as measures of the quality and the speed of production, respectively. Results obtained indicated that the allocation of human resources to problem-solving activities and the use of information technology in the manufacturing facility determined semiconductor manufacturers' problem-solving abilities and subsequent manufacturing performance.

Reflecting on definition of dynamic capabilities by Teece et al. (1997), we can observe that empirical research has put most emphasis on firms' ability to integrate, build and reconfigure *internal* competencies, while there has been less treatment of dynamic capabilities employed to integrate, build and reconfigure *external* competencies. Therefore I set out to fill in this research gap by building a model that would show how firms could go about integrating external competencies with internal ones and at the same time answer the key research

question of this study, namely what kind of strategy SMEs should adopt to systematically develop sources of competitive advantage.

6. RELATIONSHIP CAPABILITY

Keystone players, landlords and dominators have been characterized as hubs that employ different strategy and have disproportionately large number of ties with other participants in the ecosystems. I follow this approach in defining niche players, who are small, focused businesses, that exhibit 'typical' or less than typical number of ties/relationships with other ecosystem participants. Typical number of ties is the modal value of ties for participants in a particular ecosystem. Such characterization of niche players is actually characterization that applies to most SMEs, therefore I will from now on refer to SMEs as niche players, to build a coherent model of strategy for SMEs in dynamic markets based on Iansiti and Levien's taxonomy of participants in business ecosystems.

Key to success for a niche player is specialization in particular domain of competence. By leveraging relationships with other ecosystem participants, who possess complementary assets, niche players can achieve specialization while at the same time assembling complex system-level solutions often demanded by customers. Firm NVIDIA is a textbook example of a successful niche player. Its core competence is development, design and marketing of graphics processors and related software for PCs, workstations and digital entertainment platforms. By focusing on its core competence and leveraging physical assets (Taiwan Semiconductor Manufacturing Company's manufacturing facilities), as well as intellectual assets (such as third-party design tools), NVIDIA became a highly successful niche player in the business ecosystem of semiconductors and integrated circuits. The example of NVIDIA suggests that the elements of successful niche strategy are identification of keystones and other niche players in the environment, establishment of access to their assets (competencies), integration of competencies and development of specialized offerings on the basis of these competencies. Since strategic process then revolves around leveraging the relationships, I term combination of dynamic capabilities, needed to support such process, relationship capability.

Figure 4 presents the concept of relationship capability. The figure consists of three parts: the firm (SME), its environment (consisting of keystone players and niche players) and its customers. The firm is presented as an integrator, performing three interrelated groups of processes: sensing and interpreting the environment, integration of external competencies and development of specialized offerings. Activities firm performs to improve these three groups of processes are denoted as competence building. Following studies of Helfat and Raubitschek (2000), Brown and Eisenhardt (1997) and Eisenhardt (1989a), I term the firm integrator since the activities mentioned above could be considered to constitute integrating dynamic capability. Since integrating knowledge underlying dynamic capabilities can be a

source of competitive advantage (Henderson and Cockburn, 1994), I aim to examine what integrating practices focal firms perform and whether these practices might confer competitive advantage on these firms.

Processes employed to sense and interpret the environment are aimed at identification of keystone players and niche players in the firm's environment and identification of relevant strategic elements associated with these two groups of players. Such strategic elements include: types of products and services offered by keystone players and niche players, markets these types of players are in and will enter in the near future and characteristics of the strategic behavior of both type of players (e.g. technology leader/ technology follower, speed of reaction to changes in environment etc.).

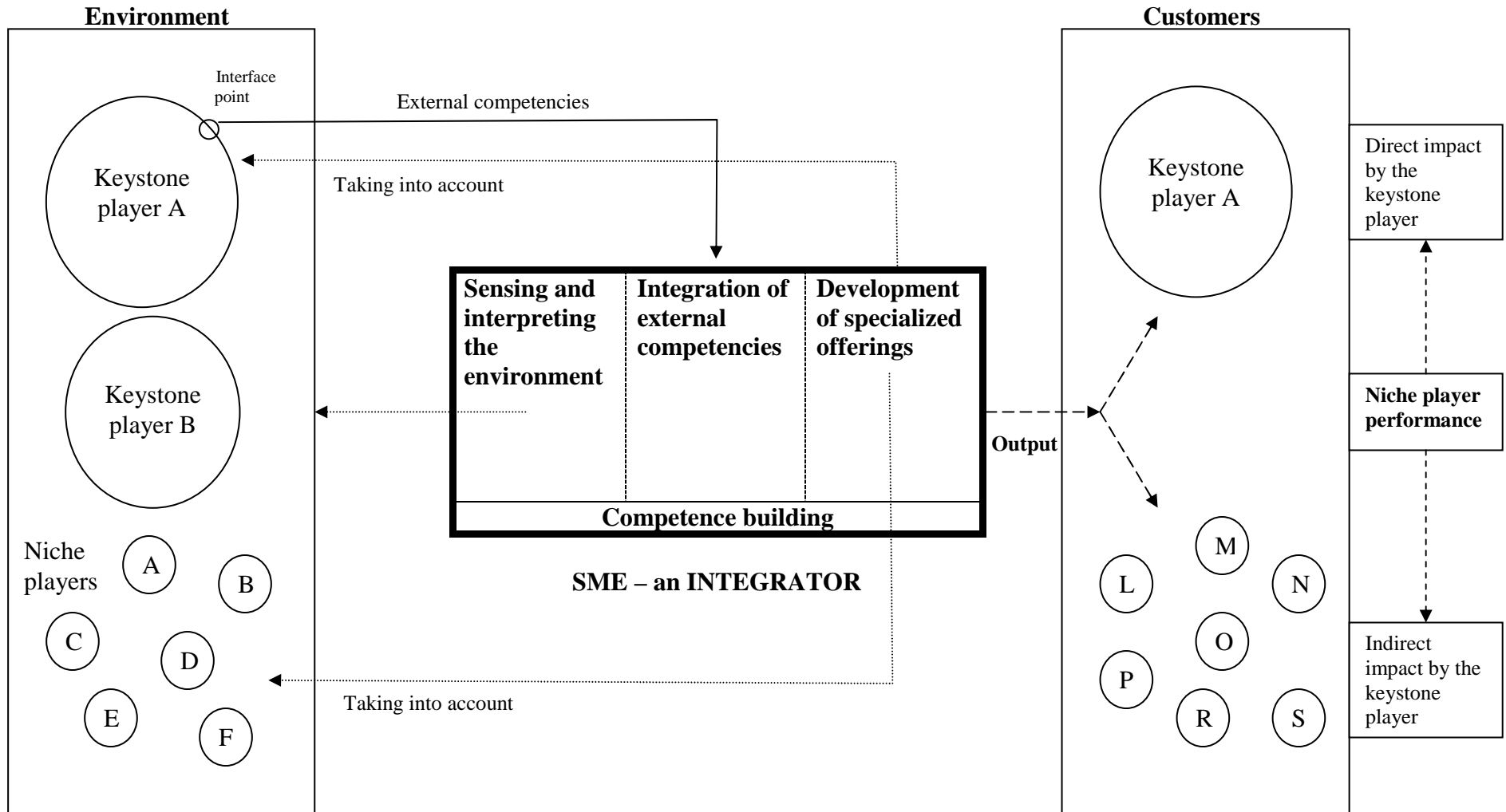
Integration of external competencies is a process aimed at enhancement of competence base of a firm. Integration capability is often critical in technology intensive industries, as keystone players' core competencies include setting standards of the industry. In that kind of situations, niche players need to develop capability to efficiently and timely integrate core competencies of keystone players, embedded in platforms or core products. Third group of processes that an integrator performs constitutes development of specialized offerings. Generally development of offerings follows integration of new generations of platforms or core products, as niche players build their offerings on top of keystone players' outputs. Typical example is Microsoft's .NET platform, which numerous niche players around the world use as a basis for their offerings. Another example is customer demand information Dell and Wal-Mart provide to their supply chain partners. Such information is actually a platform, basic building block of business strategy of niche players that supply Dell and Wal-Mart. Niche players gain access to platforms or core products through interface points that keystone players establish to stimulate adoption of their platforms. Examples of such interface points are partner programs or web portals that enable easy and efficient access.

Niche players have to develop specialized offerings, as they lack economies of scale or scope that large players enjoy. Consequently niche players can not compete on costs. Capability to develop distinctive offerings therefore has to be at the center of product/service development activities to enable niche players to stay in the market and generate positive business results. To develop distinct offerings niche players need to take into account activities of both keystone players and other niche players.

Relationship with a keystone player can have varying impact on market position and business results of niche players. In Figure 4 I distinguish between niche players that are suppliers to a keystone player (and potentially other customers) and niche players that sell their offerings only to customers other than keystone player. Based on this distinction, I distinguish between direct and indirect impact of keystone player on business results of niche players. Those niche players that supply a keystone player and other customers experience direct impact of keystone player, as they depend on both strategic and revenue side on the keystone player (the

former due to the reliance on competencies of keystone player). Those niche players that supply only customers other than keystone player experience indirect impact, as their revenues are not generated from business with the keystone player, while competencies of the keystone player remain strategically important for such niche players.

Figure 4: Relationship capability



7. RELATIONSHIP CAPABILITY IN PRACTICE: NICHE PLAYERS IN MICROSOFT'S BUSINESS ECOSYSTEM

7.1 Research questions

Research questions arise directly from dimensions of relationship capability presented in Figure 4. Iansiti and Levien (2004a) state that niche players can benefit from relationships with keystone firms, and to do so, they need to develop ability to understand their environment in terms of presence of keystone firms and platforms. The first research question is: Which managerial practices and processes SMEs employ to sense and interpret the firm's environment with respect to presence of keystone players, platforms and niche players?

Second research question concerns acquisition routines firms employ to gain access to the platform. When relevant platforms in the firm's environment are identified, managers need to employ practices that enable the firm to access interface points. Therefore, the second research question is: What managerial practices are employed to gain access to the relevant platforms?

Third research question concerns integrative process by which external competencies, embedded in platforms, are integrated in the firm's internal processes. The purpose of the integration of external competencies is two-fold: first, avoidance of efforts aimed at development of particular competencies, already readily available in the firm's environment, and second, acquisition of standardized, technologically sophisticated base upon which highly specialized, yet in essential features standardized, offerings can be developed. Integration of platform solutions in internal organizational processes necessitates existence of certain routines as platforms that embody keystone players' competencies need to be integrated efficiently. The reason is that firms need to focus energy and resources on development of specialized offerings. However, platform integration also represents opportunity for learning as the new features of platforms need to be at least partially understood to be integrated. The third research question is: How are external competencies embedded in platforms integrated in the firm and how are objectives of efficiency balanced with learning objectives?

Fourth research question relates to the development of specialized offerings that differentiate particular niche player from the others in the business ecosystem (Iansiti, Levien, 2004a). Business results ultimately rest on market success of offerings. Market success, in turn, rests upon firm's dynamic capability of development of specialized offerings. Fourth research question is concerned with managerial practices and processes employed in development processes, i.e. how are specialized offerings, based on platform solutions, developed?

The fifth and final research question addresses outcomes of SMEs affiliation with a keystone player. Literature suggests that there may be both strategic and financial benefits arising from

such affiliation, therefore the fifth research question is: How does affiliation of an SME with a keystone player affect determinants of business result (innovativeness, marketing competencies, credibility), as well as business result itself?

Table 1: Research questions

Number	Research question
1	Which managerial practices and processes SMEs employ to sense and interpret the firm's environment with respect to presence of keystone players, platforms and niche players?
2	What managerial practices are employed to gain access to the relevant platforms?
3	How are external competencies embedded in platforms integrated in the firm and how are objectives of efficiency balanced with learning objectives?
4	How are specialized offerings, based on platform solutions, developed?
5	How does affiliation of an SME with a keystone player affect determinants of business result (innovativeness, marketing competencies, credibility), as well as business result itself?

7.2 Methodology

Aim of my research is to uncover how could SMEs build competitive advantage in dynamic markets. Phenomenon of competitive advantage has been studied by numerous researchers in various fields, however some of the most detailed and robust conceptualizations and examinations of competitive advantage have been carried out by scholars in the field of strategic management. Review of relevant literature on strategic management revealed that there has been little treatment of ways in which firms could make use of external competencies, i.e. competencies that other firms in their environment possess, in the pursuit of competitive advantage. As SMEs as subject of investigation have been until recently in domain of research streams other than strategic management (e.g. entrepreneurship), strategic management has been rather silent on how might managerial practices and processes in SMEs support integration of external competencies and development of specialized offerings. As a result, dynamic capabilities in SMEs have been rather unexplored. Literature suggests that when dealing with relatively under-explored phenomena, inductive theory building research approach is appropriate. Glaser and Strauss (1967) suggested grounded theory building using comparative method. This method relies on continuous comparison of collected data and theory, and results in theoretical categories based solely on evidence. Eisenhardt (1989b) suggested more systematic approach and developed roadmap for building theories from case study research. I combined these two approaches in the course of my study, as I continually sharpened theoretical constructs I propose with newly acquired field data, and as I organized plan of research according to Eisenhardt's roadmap.

Eisenhardt proposed eight stages in building theory from case study research:

- Getting started: definition of research questions and possibly a priori constructs
 - I defined research questions after the literature review and constructed a model on the basis of perceived research gap and objectives of the study
- Selecting cases: theoretical sampling
 - I selected cases under the presumption that due to their characteristics phenomena of interest may be readily observable
- Crafting instruments and protocols: development of data collecting methods
 - I developed a set of semi-structured interview questions that I used to obtain data
- Entering the field: overlapping data collection and analysis
 - After construction of interview questions I carried out interviews and simultaneously refined the model on the basis of newly acquired data
- Analyzing data: within-case analysis and cross-case pattern search
 - I transcribed the interviews and compiled first aggregate information for each case
 - Then I searched for cross-case patterns using techniques suggested by Miles and Huberman (1994)
- Shaping hypotheses: iterative tabulation of evidence for each construct, search evidence for 'why' behind relationship
 - After establishing cross-case patterns I searched for explanation for each identified pattern
- Enfolding literature: comparison with literature
 - I compared findings of my field work with propositions by authors in the field of dynamic capabilities (Tece et al., 1997, Eisenhardt and Martin, 2000, Winter, 2003)
- Reaching closure

I used theoretical sampling (cases were chosen for theoretical, not statistical reasons, Glaser and Strauss, 1967) as it allows choice of cases in which the processes of interest are observable. I studied seven small and medium-sized information technology (IT) companies operating in Central and Eastern Europe. Unifying characteristic of these companies is that they are all partners of Microsoft. Choice to study Microsoft partner companies was based on presumption that phenomena of interest might be readily observable, as the business model of Microsoft is built on partnership with niche players that develop their offerings on the basis of Microsoft's platforms. In effect, in my view, Microsoft acts as a keystone player that explicitly enables niche players to leverage competencies embedded in its platforms.

As the general aim of this study is to uncover what constitutes competitive advantage of SMEs in dynamic markets, I approached the selection of niche players to be included in the sample by asking representatives of Microsoft in the country subsidiary to recommend niche players that are 'the best in class', i.e. have competitive advantage relative to other niche players in their business sub-domain (e.g. small systems integrator, large systems integrator

etc.). To be included in the sample, firms also had to exhibit revenue growth and profitability in the past three years. All recommended niche players but one passed these criteria. I discussed the issue with Microsoft representatives and they argued that that particular niche player has indeed experienced a drop in profitability and revenues, however they believed that the firm has successfully redefined its business and regained its competitive advantage in the current year. Therefore due to the experts' opinion that niche player was included in the sample.

I collected data through field work. The rationale was that in order to understand complex phenomena embedded in intra- and inter-organizational processes, researcher needs to obtain rich, mainly qualitative data on these processes. To establish and validate relationships among variables, researcher needs to conduct as much field work as possible. I carried out field work in two phases. In the first phase, I conducted in-depth interviews with twelve executive managers from seven niche players. In five companies, I conducted separate interviews with two individuals and in two companies I conducted interview with one person per company. Information I obtained from two managers from one company wasn't comparable to information I obtained from other respondents. Consequentially, I present findings for six niche players. In the second phase, I asked respondents to validate and complement summarized and interpreted findings based on the interviews. That kind of research approach ensured robustness of my findings, as well as enhanced practical implications. I gained additional feedback by organizing a joint meeting with the representatives of Microsoft in the region and interviewees.

For the analysis of the information obtained with interviews, I relied on approach suggested by Miles and Huberman (1994). I transcribed the interviews and coded them using list of codes that were based on the research questions. After coding the transcripts, I used software ATLAS/TI 5.0 to create matrices and that are presented in the findings part of this paper.

7.3 Findings and discussion

Findings and discussion part is organized in the following way: first summarized data on external and internal environment of niche players in the sample is presented in tables 2 and 3. Data on external environment includes information on keystone players that operate in niche players' environment, other niche players, predictability and pace of changes in the environment and respondents' assessment of strategic processes behind keystone players' and niche players' decision making. Data on internal environment includes information on sources of revenue of niche players, proportion of investments in R&D, number of employees (proxy for size), proportion of revenues generated in non-domestic markets, time of presence on domestic and non-domestic markets and visions of niche players.

Then practices and processes niche players employ to sense and interpret their environment are presented. These practices and processes include assessment of quality and suitability of keystone players' platforms, foresight of direction of platform development, attitude towards potentially adverse actions of keystone players and consideration of keystone and niche players' activities in development of offerings processes. Before presentation of three-phase process that is employed to integrate platforms, motivations to adopt platforms and competencies actually obtained through integration of platforms are discussed. Discussion of practices and processes employed to develop specialized offerings completes analysis of relationship capabilities in niche players in the sample.

With respect to differentiation, two strategic orientations of niche players and managerial capabilities that support them are presented. Results of niche players' cooperation with Microsoft are generally positive and are presented before final comments on relationship capability of niche players in the sample.

7.3.1 External and internal environment of niche players in the sample

Table 2: The external environment

External environment				
Keystone players in the environment (Q EXT.1)	Niche players in the environment (Q EXT.2)	Predictability and pace of changes in the environment (Q EXT. 3)	Keystone players' decision making (Q EXT.4)	Niche players' decision making (Q EXT.4)
<ul style="list-style-type: none"> • Microsoft, Hewlett-Packard (HP), IBM, Cisco, Oracle • Microsoft acts as the most important keystone player in four cases • In two cases HP is the most important as a keystone player • In one case IBM acts as an important keystone player • Microsoft acts as a textbook keystone player, whereas HP and IBM are more passive when it comes to managing partners 	<ul style="list-style-type: none"> • IT industry focal firms operate in consists of several systems integrators and few software developers • System integrators: large (200+ employees), middle sized (15-50), small (1-15) • Software developers: mostly small (1-15) and one large (500+) 	<ul style="list-style-type: none"> • General consensus: changes in the IT industry are fast, unpredictable • Niche players know that the changes are constant and unpredictable, and try to amortize the unpredictability with measures such as close affiliation with the keystone players • There is predictable trend of shift in the market from selling of products to selling of services 	<ul style="list-style-type: none"> • Keystone players in the country and in the region behave strategically, according to directions from corporate headquarters • Microsoft country subsidiary is the most adaptive to local market of major firms' subsidiaries 	<ul style="list-style-type: none"> • Industry trends represent border conditions for niche players • Most niche players operate in the way that they make simple, tactical decisions on the basis of existing knowledge, according to the perceived opportunities • Large niche players tend to put more emphasis on strategic aspects of decisions, which sometimes include utilization of their size

Source: Own work.

Table 4: The internal environment

Internal environment						
Sources of revenues (Q INT.1)	Investments in R&D as a percentage of revenues (Q INT.2)	Number of employees (Q INT.3)	Proportion of revenues generated in non-domestic markets (Q INT.4)	Presence on the domestic market (Q INT.5)	Presence on the non-domestic markets (Q INT.5)	Vision of the firm (Q INT.6)
<ul style="list-style-type: none"> • Selling of licenses for products (reselling): 50% • Services: 50% • In services, 50% systems integration, 50% own solutions 	<ul style="list-style-type: none"> • Median value 10% • Asymmetric distribution, 4 niche players out of five invest up to 10% of revenues in R&D 	<ul style="list-style-type: none"> • Median value 40 • 2 small niche players (up to 15 employees) • 2 medium sized niche players (15-50 employees) • 2 large niche players (300+ employees) 	<ul style="list-style-type: none"> • Median value 4% • One niche player stands out with 80% 	<ul style="list-style-type: none"> • Five niche players established in the beginning of 1990s • One niche player established in 1986 	<ul style="list-style-type: none"> • Two niche players not present (apart from individual projects) • Three niche players present between 1-6 years • One niche player present for 15 years 	<ul style="list-style-type: none"> • Visions of niche players are similar • Systems integrators: to become first or among the first players in the segment (in domestic and/or regional markets) • Developers: one to become leader in Europe in its segment, the other one global leader in its segment

Source: Own work.

Dynamic markets are defined as markets where changes in technologies, market participants and successful business models occur frequently, relatively fast and in a relatively unpredictable fashion (Eisenhardt, Martin, 2000). Responses of interviewees to questions on predictability and pace of changes in the environment suggest that IT industry is a dynamic market, however according to typology by Eisenhardt and Martin (2000) a moderately dynamic one. Technological changes in the IT industry are fast and unpredictable, whereas market changes are slower and more predictable. It is well known who market participants are and the overall market structure is relatively stable.

Small niche players try to outmaneuver larger ones with focus on identification and exploiting of short-term opportunities. Several examples given by interviewees indicate that there is value in simple routines, especially for the smallest players. Some of the simple routines/decision rules interviewees quoted were:

- If a keystone player promotes certain product/service/solution in the local events, we start investing in development of knowledge on that offering
- We don't enter crowded market segments
- We select projects that have learning potential even though they may not be very profitable
- We integrate new versions of Microsoft's platforms as soon as possible
- We hire people on the basis of their demonstrated capability of fast learning
- We don't compete on price

Niche players in the sample on average generate 50% of their revenues with sales of hardware and licenses for software and 50% with sales of services. 50% of revenues generated with services are contributed by systems integration services and the other 50% by sales of software solutions developed by niche players. Since niche players in the sample differ in their strategic orientation, the proportion of revenues they invest in R&D activities is asymmetrically distributed. One niche player invests close of 100% of revenues in R&D, whereas other one outsourced R&D and doesn't invest in it. However, median value of investments in R&D is 10% of revenues. Sample is constituted of 2 small niche players, 2 medium sized niche players and 2 large niche players, with 40 employees being the median value. Proportion of revenues generated in non-domestic markets is up to 15%, with one niche player standing out with 80% of revenues. The same company stands out also in terms of presence in non-domestic markets, as it has been present there for 15 years. Four other niche players that are also present on non-domestic markets have been present there for 1-6 years. All niche players but one have been established in 1990s and are up to 15 years old. Visions of niche players are similar and centered on achieving one of the top positions in relevant markets.

7.3.2 Sensing and interpreting the environment

Relationship capability is a three dimensional construct, constituted of managerial practices and processes that are employed in SMEs, first, to sense and interpret firm’s environment, second, to integrate external competencies embodied in platforms in the firm and third, to develop specialized offerings based on platform solutions. I hypothesize that firms might differ in processes and practices they apply with respect to the nature of their relationships with the keystone players. I constructed concept of level of attachment to the keystone player, and observed whether any patterns in processes and practices in niche players relative to their different levels of attachment to Microsoft could be identified. Level of attachment for a particular niche player has been assessed according to responses of interviewees to the following interview questions:

- Which platforms of which keystone players do you use as the basis of your offerings?
- Why did you decide to use particular platform? Why did you decide to cooperate with particular keystone player?
- What do you get out of the collaboration with particular keystone player and the use of its technologies?

Throughout the findings, niche players in the sample are ranked according to their level of attachment to Microsoft (see Figure 2). I reasoned that classification of niche players in a matrix will help to identify potential patterns in processes that may arise from different levels of attachment to a particular keystone player. Six niche players in the sample were labeled as Alpha, Beta, Gamma, Delta, Pi and Omega. The agreement has been made with all interviewees that the identity of their firms will be covered in exchange for detailed information on processes and practices they employ. Respondents’ individual replies are provided in the Appendix 2.

Figure 5: Level of attachment to Microsoft

Level of attachment High ↑ Low	Firm
	Alpha
	Beta
	Gamma
	Delta
	Pi
Omega	

Source: Own work.

The managerial processes that niche players employ to sense and interpret their environment are presented in Table 4. Number in parentheses under the element indicates number of

question the element refers to (see Appendix 1). For individual responses, see Table 1 in the Appendix 2.

Table 4: Practices and processes employed to sense and interpret the environment

Element of sensing and interpreting the environment	Findings
Assessment of the quality and suitability of the platform (Q1.6)	<ul style="list-style-type: none"> • Companies that are more attached to Microsoft put less emphasis on employing processes for assessment • The largest companies in the sample employ systematic approach to assessment
Foreseeing the development of the platform (Q1.7)	<ul style="list-style-type: none"> • Niche players predict development of platforms on the basis of keystone players' roadmaps • Niche players invest in platforms that have gained appropriate market acceptance
Worries with respect to potential adverse effects of some keystones' actions (Q1.3)	<ul style="list-style-type: none"> • Niche players are worried that some actions of keystone players might adversely affect their market position • Such concern is overwhelming in the area of system integration services and less present in the area of solutions development
Taking into account keystone players when developing offerings (Q3.2)	<ul style="list-style-type: none"> • Niche players take into account activities of keystone players
Taking into account other niche players when developing offerings (Q3.3)	<ul style="list-style-type: none"> • Niche players take into account activities of other niche players

Source: Own work.

On the first element, assessment of the quality and suitability of the platform, it can be seen that companies that are more attached to Microsoft put less emphasis on employing processes for assessment. Most apparent reason for that is their belief that Microsoft's platforms are very good and no other keystone player will endanger that situation in the near future. These niche players substitute strategic analysis for reliance on competencies of the keystone player. In that way they save time and resources for development of offerings, which is in line with Iansiti and Levien's prediction and goes to show how important it is for niche players that major firms they are attached to adopt keystone strategy. Attachment to a major firm adopting landlord strategy could result in appropriation of value created by the landlord, which would put niche players in a dangerous position. As we move down the level of attachment spectrum, we see that two companies that are least attached to Microsoft employ systematic approach to assessment. One company established formal body that assesses platforms up-front and by doing that reduces risk that some platform may prove inappropriate in the latter phases of projects. Another company goes one step further and in some cases develops

platform-related knowledge that keystone players don't have yet. Potential explanation for such situation might lie in the fact that these two niche players are the largest companies in the sample, therefore in contrast with smaller counterparts have resources and capabilities for systematic approach.

Reliance on keystone players is further evidenced by the fact that niche players predict development of platforms on the basis of keystone players' roadmaps. Access to roadmaps is conditional on partner status, and niche players see them as a tool in developing their own roadmaps. However, when deciding on investments in knowledge on new platforms, niche players tend to be conservative and invest in platforms that have gained appropriate market acceptance. Up-front investments are rather rare, and occur in niche players that position themselves as companies who are on the cutting edge of technology (both development niche players in the sample).

Generally, niche players are worried that some actions of the keystone players might adversely affect their market position and consequentially performance. There is an overwhelming concern for the area of system integration services, as this is an area traditionally left to partners on the side of Microsoft. There is less concern in the area of solutions development, as niche players see their advantage in the ability to provide customized solutions. Niche players do not have explicit strategies to address this trend, apart from one niche player, who is trying to strengthen its position in the region by offering higher value for money by offering customized solutions and accompanying consulting services.

Understanding of actions of keystone players and other niche players and considering those actions when making decisions are important elements of environment-sensing and interpreting capability (Iansiti, Levien, 2004a). Niche players in our sample unequivocally take into the account activities of keystone players and niche players. This takes place, with respect to keystone players, in the form of mimicking development processes of keystone players, assessment of markets and technologies keystone players are in, as well as assessment of importance of particular features to keystone players and their potential inclusion in future versions of the platform. Niche players see other niche players as both potential competitors and partners, and their activities and presence in certain markets is considered by respondents an important factor when deciding on whether to enter new markets.

7.3.3 Access to the platforms and competencies obtained

Second and third dimension of relationship capability are practices and processes that niche players employ to integrate platforms in their processes and to develop specialized offerings on the basis of these platforms. Precondition for integration and development processes is gaining access to the platform. Keystone players build their business model on relatively

straight-forward standardized access to the platform. However, niche players, who use platforms as basis of their offerings, do not by definition become de facto strategic partners of keystone players. Level of partnership is different, and since all companies in our sample have status of Microsoft Certified Partner, with majority being Microsoft Gold Certified partners, they can be considered Microsoft's strategic partners in the region. This means that their initial access to the platform also meant start of a strategic partnership. Table 2 in Appendix 2 presents how niche players gained access to the platform and started their partnership with Microsoft. Note that in two cases, Hewlett-Packard (HP) appears as the major partner, along with Microsoft, and therefore information refers to HP and points to certain differences in interfaces and partner models of the two firms. Discussion of these differences would be beyond the scope of this thesis, and I present this information with purpose of indicating that there are differences among business models of major firms with respect to access to platforms.

It is evident that the usual way to gain access to the platform was to exhibit ability to sell large number of licenses for Microsoft products. Most of niche players in the sample started collaborating with Microsoft in mid 1990s, when selling of licenses was the most important activity for Microsoft. With its model, Microsoft enabled niche players to be commercially successful, which in turn enabled them to grow. In contrast with Microsoft's commercially oriented model, HP granted access to its platforms to companies that were able to participate in its development process. In terms of the accessibility of platforms, Microsoft's model was characterized by proactive commercial and technical support of partners, whereas HP was more reactive to initiatives by niche players.

Following from access to the platform is access to competencies embedded in platforms. Table 5 presents motivation to adopt platforms and competencies actually obtained. Number in parentheses indicates interview question the finding refers to. Table 3 in Appendix 2 presents more details on motivations to adopt platforms.

Table 5: Motivation to adopt platform and competencies obtained

Motivation to adopt platform (Q1.2)	Competencies obtained (Q4.1)
<ul style="list-style-type: none"> Prevailing motivation was to obtain development tools at low-cost 	<ul style="list-style-type: none"> Marketing and technological competencies

Source: Own work.

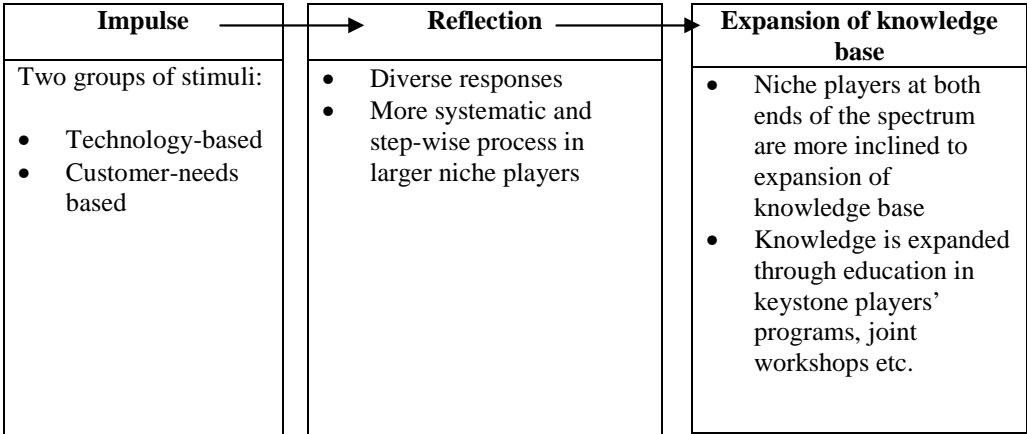
Prevailing motivation to adopt Microsoft's platforms and become its partner was to obtain development tools at low-cost. This indicates that before joining the Microsoft's business ecosystem, niche players saw it as primarily technological company. However, competencies actually obtained have turned out to be marketing as well as technological. Market impact of Microsoft's brand lends credibility to partners, which in turn widens range of their potential customers. This is especially important when niche players enter international markets (in

some cases, international leads are supplied to partners by Microsoft, which is again consequence of its competence of market intelligence). Niche players utilize Microsoft’s recognition in the market by positioning themselves as Microsoft’s partners. Microsoft’s market recognition is the end product of its marketing competencies, which niche players indirectly integrate and capitalize on. Microsoft's marketing activities (events, conferences etc.) also raise market awareness of niche players.

7.3.4 Integration of the platforms

In previous paragraphs motivation of niche players to adopt platforms has been discussed. We now turn to actual practices and processes that niche players employ to integrate those platforms in their processes. These processes results in the integration of keystone players’ competencies embedded in the platforms. Figure 6 presents platform integration processes in niche players.

Figure 6: Platform integration processes



Source: Own work.

Three phases in platform integration processes have been identified: impulse, reflection and expansion of knowledge base. Impulse phase is preceded by ongoing collection of information (online, through personal contacts) on global technological trends, keystone players’ activity and local market potential of new technologies. Impulse phase includes stimuli that entice niche players to start deliberating on potential integration of new platforms in their processes. Two groups of stimuli have been observed: technology-based stimuli and customer needs-based stimuli. Technology-based stimuli refer to new platforms or new version of the platforms developed by Microsoft, global trends in certain technological areas etc. Customer needs-based stimuli refer to perceived or explicitly expressed customer needs, with potential or actual customer demand following.

Business domain is a moderating variable in the impulse phase; niche players that are positioned as developers of software swiftly react to technology based impulses and integrate new technologies, whereas niche players that are positioned as systems integrators tend to wait to see whether customers are interested in offerings on the basis of new technologies. Level of attachment to a keystone player also acts as a moderating variable; it can be seen from Figure 1 in Appendix 2 that niche players that have higher level of attachment to Microsoft are more inclined to react to technology-based stimuli, whereas with lowering level of attachment niche players tend to become relatively more responsive to customer needs-based stimuli.

In reflection phase, responses of niche players are rather diverse. Most emphasis in the analysis is put on the assessment of local market potential of a certain new technology and its suitability for customer needs. More systematic and step-wise process was observed in two large niche players, who also tend to be more receptive to the new platform integration than niche players in the middle of the level of attachment to Microsoft spectrum. Niche player at the top of this spectrum is again much inclined to unconditionally integrate new Microsoft's platforms. That kind of pattern might be explained by the fact that the latter player is closely following Microsoft on its technological development activities, whereas the former two players are engaging in wider area of markets and technologies than companies in the middle of the spectrum, and take on relatively lower additional risks than those niche players if they set out to integrate new platforms.

Identification of stimuli and analysis of information they contain require managerial capabilities of market intelligence and balancing of short term and long term perspective. The rationale for the balancing capability is that costs of integration of new technologies usually occur immediately, while benefits start flowing at some time in the future. Too much emphasis on short term perspective can result in under-investment and slow erosion of technological parity with competitors, whereas too much emphasis on potential future benefits can result in over-investment in some technologies that market can not absorb.

In the expansion of knowledge base phase the integration of new platforms takes place. Precondition for those activities is that in previous phase niche players have assessed that potential benefits of new platform integration will exceed costs associated with it. Again, niche players at both ends of the spectrum are more inclined to come to such conclusion than niche players in the middle of the spectrum. At the heart of integration is acquisition of knowledge on features and functionalities of platforms. Integration of external competencies in niche players in the sample occurs primarily through knowledge transfer between Microsoft's experts and niche players' engineers in joint workshops, seminars etc. For the three largest niche players in the sample, transfer of knowledge is more direct, as they participate in Microsoft's Partner Strategy Consultant program. This program includes part-time presence of an assigned Microsoft's expert on niche player's site and his/her participation in niche player's projects. Niche players rely on Microsoft's capabilities to

manage mechanisms of knowledge transfer (sort of outsourcing of business processes to Microsoft). However, there are certain challenges that require attention of niche players' managers. One of such challenges is scheduling of knowledge transfer in a way that it doesn't significantly interrupt day-to-day operations. Two smallest niche players in the sample exhibit different pattern. They primarily rely on self-directed education and internal training in one case and training through projects for customers in the other.

7.3.5 Development of offerings

By definition, niche players focus on single or at most couple of products or services that they offer to the market. Keystone players generate economies of scale and scope that arise from supplying platforms that embody solutions to problems common to the majority of firms in a particular industry or sector. Consequentially, niche players can achieve viability only if their offerings are clearly differentiated from offerings by keystone players

One of potentially many ways of differentiation is through development of specialized offerings that are outside the domain of solutions platforms already embody (see Figure 7). Specialized offerings enable niche players to differentiate themselves relative to the keystone players. Differentiation relative to niche players that offer similarly specialized offerings is a harder task. In the study it has been observed that niche players have clear strategy of differentiation relative to the keystone players. Niche players' offerings are customized to such extent that functionalities of these offerings are outside the domain of generic functionalities of platforms. On the other hand, niche players stated very similar factors when asked about ways of differentiation relative to other niche players. Factors stated in all but two niche players out of six were list of reference projects, experience and speed of execution.

Figure 7: Domain of platforms and specialized offerings

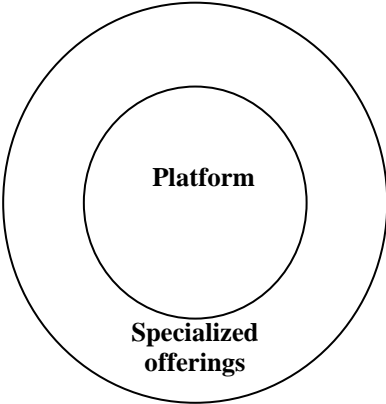


Table 6 presents patterns we observed in development of offerings processes

Table 6: Development of offerings processes

Development of offerings processes – findings
<ul style="list-style-type: none"> • Level of standardization and formalization of development of offerings processes increases with the size of the firm and level of responsiveness to technology based stimuli • Relative to platform integration processes, development of offerings processes tend to be more autonomous

Source: Own work.

Correlation between development of offerings processes and size and responsiveness to technology-based stimuli has been observed. Level of standardization and formalization of development of offerings processes increases with the size of the firm and level of responsiveness to technology-based stimuli. The latter is according to the interviewees necessary due to the complexity of niche players’ technological environment. Another pattern has been observed: relative to platform integration processes, development of offerings processes tend to be more autonomous, meaning that niche players tend to conduct development activities in relatively less collaborative manner than integration of platforms. Such situation might result from niche player’s belief that joint development with keystone players might result in knowledge and competencies transfer and consequentially in the erosion of the competitive advantage of niche players. However there may be potential in joint development based on principles of open innovation model (Chesbrough, 2003). Development of offerings processes are presented in Table 4 in the Appendix 2.

7.3.6 Differentiation and sources of competitive advantage

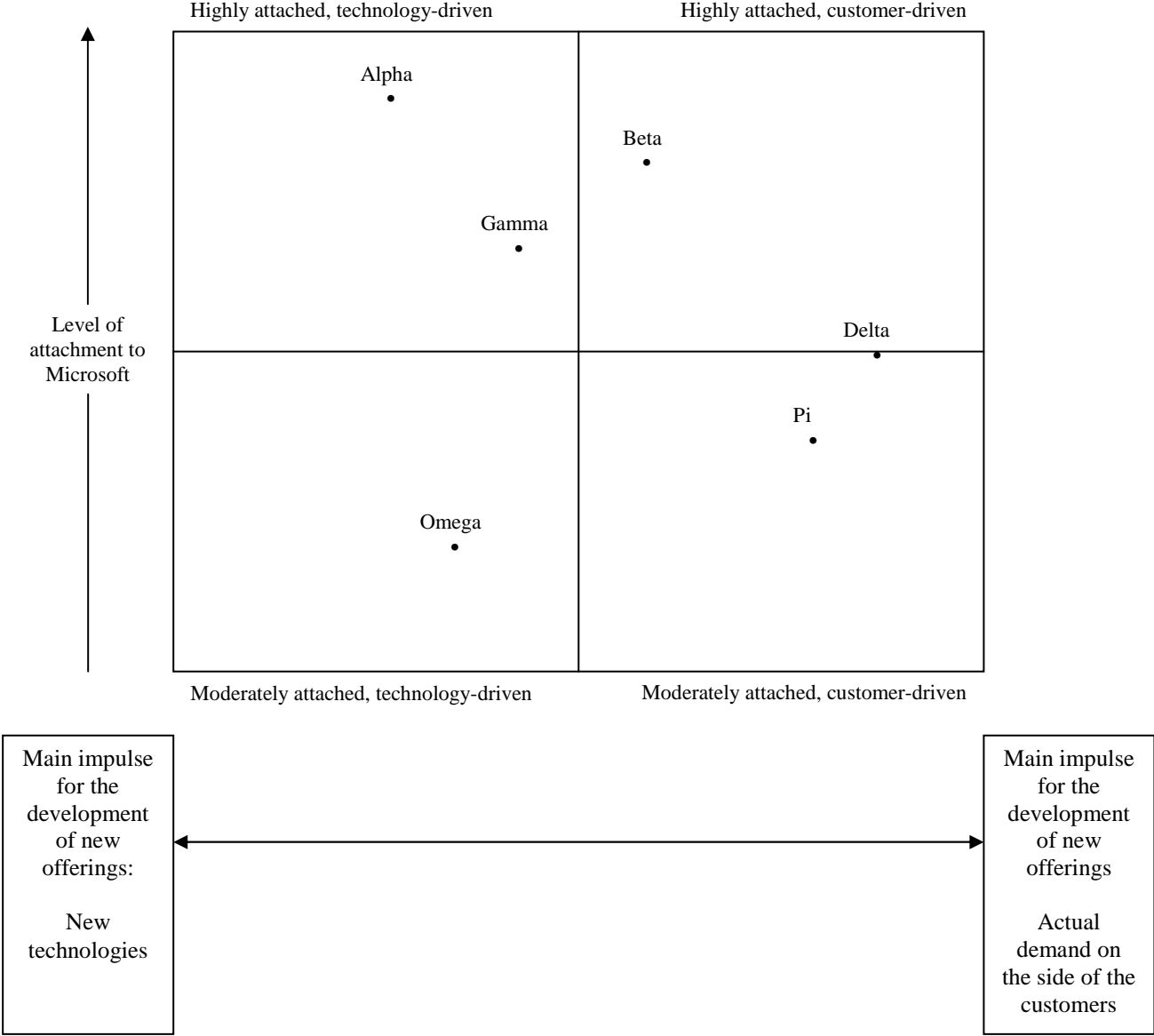
Analysis revealed that niche players adopt two types of strategic orientation. I term them technology driven and customer driven strategy, where classification depends on the main driver for development of new offerings. Such classification is partly artificial, as all niche players in sample provide technologically relatively sophisticated offerings and professional customer service. However, since niche players are often limited in human and financial resources, they can not invest in both constant adoption of the newest technologies and development of commercial relationships with customers. These two sets are activities that are often in conflict, as the first requires a good deal of internal learning and knowledge transfer in seminars and workshops, while the second requires field work with customers. In simple terms, employees of niche players can not acquire knowledge and work with customers at the same time, and there is usually not enough time to do both. Therefore niche players need to make tradeoff between emphasis on development of technologically most advanced offerings and development of less advanced but more customized solutions. Figure 8 shows that two niche players (Alpha and Omega) adopted technology driven strategy and invest heavily in adoption and deployment of cutting edge technologies, whereas other four niche players (Beta, Gamma, Delta, Pi) are primarily concerned with customization of their (less technologically) advanced offerings.

Figure 9 shows how niche players support their strategic orientation with resources and capabilities. As resources of players in the IT industry reside in skills of their employees these resources are termed human resources. Technology driven niche players position themselves as suppliers of offerings at the cutting edge of technology. Key resources for these niche players are capacity for fast learning and self-motivation of their employees. First resource supports fast adoption of new technologies, whereas second resource ensures that employees on their own acquire knowledge that they didn't have time to acquire during office hours. Managers of such niche players deploy capabilities that support generation of ideas by employees, as well as their education and training. As technologies are often very complex, individuals need to persevere in the process of their acquisition. Managers need to instill culture of perseverance in their firms so that intensive, round-the-clock technology acquisition projects get completed.

Development of productive relationships with customers that underpins strategic orientation of the remaining four niche players in the sample requires rather different human resources and capabilities. Human resources customer-driven niche players rely on are customer-relationships skills, such as efficient communication, professional approach and ability to generate trust of customers. Managers support deployment of these resources by careful selection and development of right people and development of organizations that have long-term purpose. By establishing good organizational climate managers contribute to effective functioning of teams. Altogether these capabilities are deployed to translate resources of

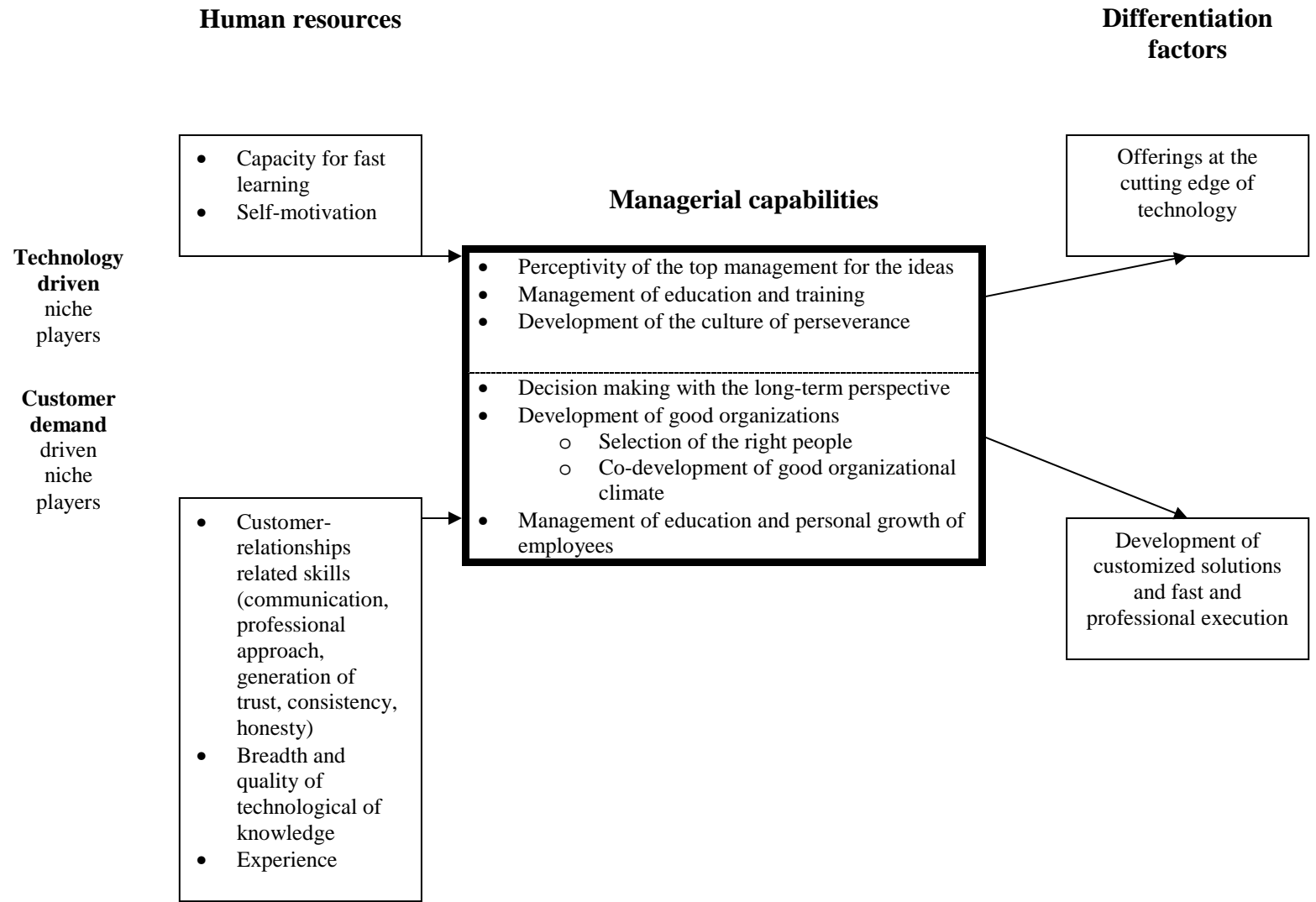
customer driven organizations in solid customer relationships that differentiate these niche players from the others.

Figure 8: Differentiation of niche players



Source: Own work.

Figure 9: Differentiation and the underlying capabilities



Source: Own work

7.3.7 Results of cooperation with Microsoft

The interviewees quoted similar gains they thought arose from cooperation of their firms with Microsoft. The gain stated the most was credibility; respondents unequivocally concluded that collaboration with Microsoft raised credibility in their firms in the eyes of customers. To capitalize on raised credibility, niche players make use of co-branding (using Microsoft's brand when promoting their offerings), which is especially relevant when entering international markets. Microsoft's participation in major international events such as Cebit and presentation of its partners there expands range of accessible markets for these partners. In local market, Microsoft's events and other promotional activities serve to increase market's awareness of niche players that Microsoft promotes. Third most cited group of gains was technological gains. Respondents cited ongoing technological support in real time and efficient access to the newest technologies as the most important technological gains.

The respondents were also asked to assess effects of cooperation on innovativeness, sales growth and revenues. According to the respondents, cooperation with Microsoft has an insignificant effect on innovativeness. They cited one situation when keystone players positively influence innovativeness of niche players, and that is when the platform expands. In most cases that results in integration of certain functionalities, previously provided only by niche players' offerings, in the platform. When that occurs, niche players need to innovate and provide offerings that have functionalities not provided by the expanded platform. If we consider innovativeness as a proxy for differentiation capability, we can conclude that dynamic capabilities that support development of differentiated offerings are not positively affected by cooperation with a keystone player. Two respondents argued that tight cooperation that turns into an intensive following of a keystone player may result in lower innovativeness, as firms in such situations tend to neglect their own differentiation capabilities.

On average cooperation with Microsoft contributes 40-50% of niche players' revenues. 50% of Microsoft-related revenues are generated with sales of licenses for Microsoft's products, and other 50% with services and solutions developed on the basis of Microsoft's platforms. In four cases out of six niche players allowed for a possibility that they wouldn't exist in such form as they do today if they haven't cooperated with Microsoft. However, they believe they would cooperate with some other keystone player if Microsoft didn't exist. On the issue of contribution of cooperation to sales growth respondents had divergent opinions. There were a few negative responses, especially related to Microsoft's provision of sales leads and establishment of contacts with desired clients, and a few positive comments, mainly from niche players less attached to Microsoft. We can conclude that cooperation with Microsoft raises profile of niche players, however sales growth can only be achieved by the niche players themselves.

Table 7: Results of cooperation with Microsoft

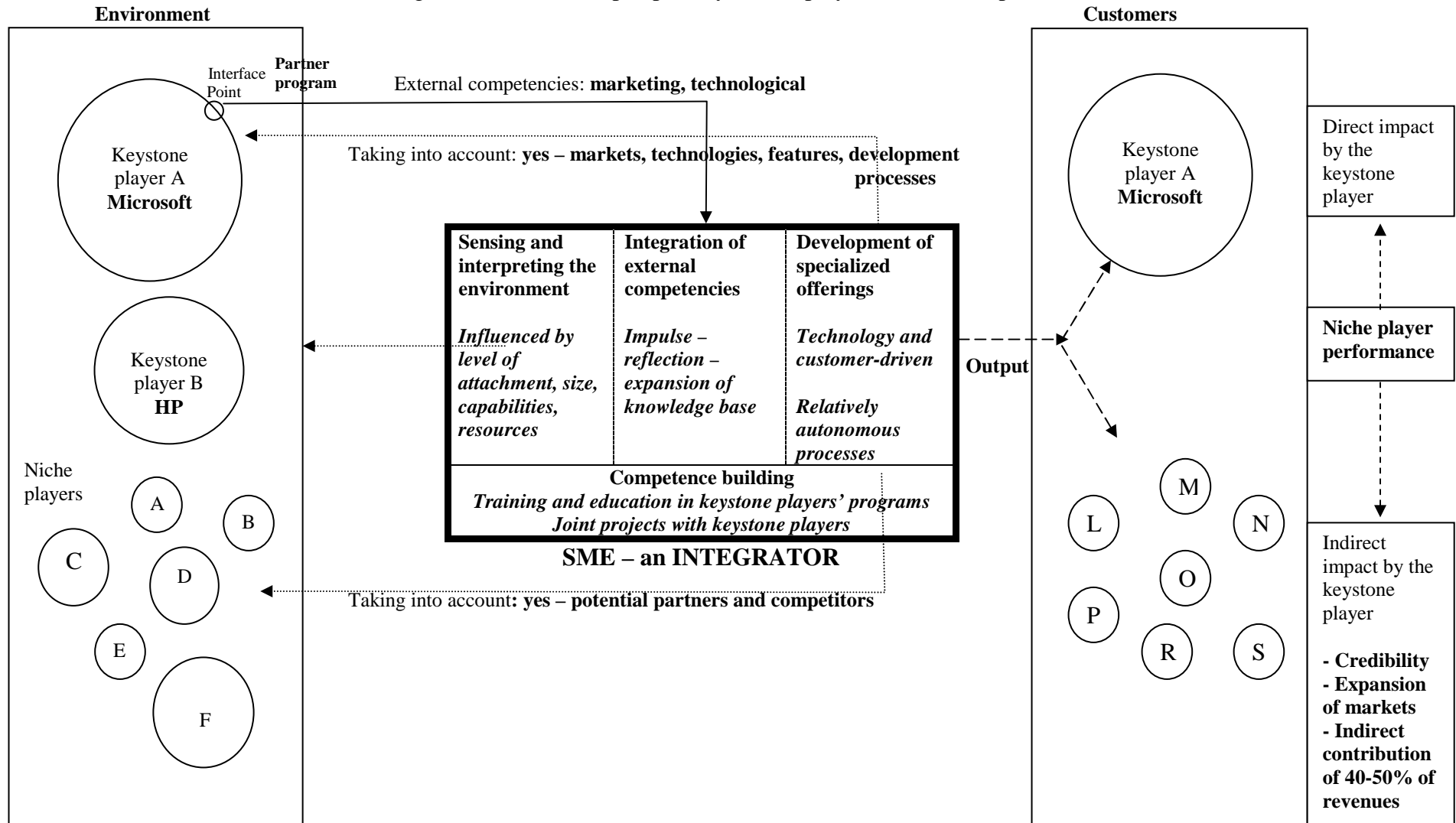
Results of cooperation with Microsoft				
Gains from cooperation (Q4.1)	Effects of cooperation on sales growth (Q4.2)	Effects of cooperation on credibility in the eyes of clients (Q4.2)	Effects of cooperation on innovativeness (Q4.2)	Effects of cooperation on revenues (Q4.3)
<p>Gains in three areas:</p> <ul style="list-style-type: none"> - credibility - marketing - technology <p>Marketing area:</p> <ul style="list-style-type: none"> - expansion of accessible markets - higher market awareness of niche players (and associated credibility) due to Microsoft-organized events and co-branding (especially important when entering international markets) <p>Technology area:</p> <ul style="list-style-type: none"> - ongoing technological support in real time - efficient access to the newest technologies 	<ul style="list-style-type: none"> - mixed responses, divergent opinions - a few negative responses, especially related to Microsoft's provision of sales leads and establishment of contacts with the desired clients - collaboration with Microsoft raises profile of niche player, however sales growth can only be achieved by the niche player alone 	<ul style="list-style-type: none"> - unequivocal conclusion that collaboration with Microsoft contributes importantly to credibility of niche players 	<ul style="list-style-type: none"> - cooperation with Microsoft has insignificant effect on innovativeness of niche players - expansion of platform can have positive influence on innovativeness of niche players; they need to be innovative to be able to build their offerings on the top of the platform - intensive following of Microsoft can lead to lower innovativeness 	<ul style="list-style-type: none"> - on average cooperation with Microsoft contributes to 40-50% of niche players' revenues - in four cases out of six niche players allow for possibility that they wouldn't exist in such form as they do today if they wouldn't cooperate with Microsoft - they believe they would cooperate with some other keystone player if they didn't cooperate with Microsoft

Source: Own work.

7.3.8 Relationship capability in practice: niche players/Microsoft's partners

Figure 10 presents findings in the context of relationship capability framework introduced in Figure 4. External environment of niche players in the sample is characterized by presence of one keystone player (Microsoft) and another major firm (HP) that functions as the most important keystone player to two niche players in the sample. Other niche players function as potential partners and competitors. Sensing and interpreting of the environment is influenced by level of attachment to Microsoft, size, capabilities and resources. Niche players in the sample integrate marketing and technological competencies from Microsoft. Integration takes place in a three-phased process, consisting of impulse phase, reflection phase and expansion of knowledge base phase. Integration of Microsoft's competencies is central competence building activity, and it occurs through training and education in Microsoft's programs and through joint projects. Niche players adopt technology-driven and customer-driven strategic orientation, which influences their market positioning and capabilities that support differentiation. Although development of offerings takes place in a relatively autonomous fashion, niche players take into account activities of both keystone players and other niche players. All companies in the sample are selling their offerings to customers other than Microsoft therefore they experience indirect impact of cooperation. Most positive gains from cooperation is credibility and expansion of markets, whereas cooperation with Microsoft contributes on average 40-50% of niche players' revenues in the form of sales of licenses for Microsoft's products and sales of solutions developed on Microsoft's platforms.

Figure 10: Relationship capability– niche players/Microsoft's partners



Source: Own work.

8. CONCLUSION

Markets for virtually every type of goods have become truly global in the last decade. Efficient communications, relocation of production to countries with low labor costs, outsourcing of business processes and entrepreneurial expansion in China and India are just a few factors that have significantly affected dynamism of global markets. New strong competitors are springing all over the world at an increasing pace, making it all the more important that firms develop sound strategies to address competitive challenges. While all markets experience increased dynamism, in the technology-intensive industries fast technological changes compound it. In relatively highly global technology industries, market success is increasingly being achieved on the basis of ability of firms to adapt to ever shifting markets. Such ability rests on dynamic capabilities of firms, i.e. organizational processes that firms deploy to integrate, build and reconfigure internal and external competencies. Dynamic capabilities include well known processes such as product development, strategic decision making and alliancing. By deploying dynamic capabilities, managers reconfigure resources in the pursuit of competitive advantage. In dynamic markets competitive advantage is rather transient, making constant deployment of dynamic capabilities essential.

While resource based view of the firm, intellectual antecedent and the foundation of dynamic capabilities approach, posits that valuable, rare and inimitable resources reside within the firm, networks-based perspective of strategy suggested that such resources may reside also outside the firm. This suggestion indicates that there may be significant potential in research of ways in which firms access external resources and mechanisms that support transformation of acquired resources in sources of competitive advantage.

However, as by definition according to the resource based view valuable resources are not transferable, potential for research may lie in examination of transfer and integration of competencies. The rationale is that certain products/services have competencies embedded in them. Examples of such products/services are platforms, which are sets of solutions to problems common to the majority of firms in a particular industry. Platforms embody competencies of the firms that supply those platforms in the sense that significant technological knowledge is needed to develop solutions to common problems and standard setting competencies are needed to establish particular platform as a building block for offerings of majority of firms in an industry. By integrating standards-based, technologically sophisticated platforms firms bypass several development activities, which frees the time, energy and resources for development of their own offerings. Platform suppliers therefore enhance productivity of several firms that use their offerings and effectually function as the keystone players. On the other hand, firms that use platforms as the basis for their offerings and develop specialized offerings act as the niche players.

SMEs, focal firm population of this study, generally act as niche players. This study presents framework for design of strategy of niche players. The framework is built on the basis of dynamics of relationships between niche players and keystone players. Framework presents dynamic capabilities that support integration of external competencies embodied in platforms and that support development of specialized offerings on the basis of platforms. Together these dynamic capabilities constitute relationship capability, which underpins competitive advantage of niche players in dynamic markets.

The thesis presents findings of the study of the relationship capability in a sample of six European niche players in the IT industry. The most important keystone player for these niche players is Microsoft, from whom niche players integrate marketing and technological competencies. Niche players adopt technology-driven and customer-driven strategic orientation, which influences their market positioning and capabilities that support differentiation. Technology-driven orientation is supported by the deployment of dynamic capabilities that support generation of ideas by employees, as well as their education and training. Managers work to instill culture of perseverance in technology-driven firms so that intensive, round-the-clock technology acquisition projects get completed. Customer-driven orientation is based on customer-relationships skills, such as efficient communication, professional approach and ability to generate trust of customers. Managers support deployment of these resources by careful selection and development of the right people and development of organizations that have long-term purpose. By establishing good organizational climate managers contribute to effective functioning of teams. Cooperation with Microsoft raises profile and credibility of niche players in the eyes of the customers, as well as contributes on average 40-50% of niche players' revenues.

The study contributes to the strategic management literature as it provides new concept of strategy. The concept of relationship capability is based on leveraging relationships and it represents fusion of resource based view/dynamic capabilities approach with the networks-based perspective of strategy. Study also empirically investigates dynamic capabilities that support integration of external competencies, the aspect of dynamic capabilities that so far hasn't been extensively researched. The study contributes to the entrepreneurship literature by focusing on type of firms that are at the center of entrepreneurship research, i.e. small and medium-sized enterprises (SMEs). As it is focused on the intersection of strategic management and entrepreneurship research, the relationship capability framework contributes to the emerging field of strategic entrepreneurship as well.

Niche players in the sample build their successful business strategies on the basis of relationship with Microsoft, whereas Microsoft became one of the most successful firms in the world on the basis of understanding that cooperation with niche players is good business. It goes to show that in the networked global business environment winners are and will be firms that understand strategic logic of leverage and operate with coopetitive mindset.

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APPENDIX 1

The interview questions

External environment: (EXT)

1. Who are the keystone players in your environment?
2. Who are the niche players in your environment (what do these companies do/offer)?
3. Is your business environment characterized by changes that are fast, unpredictable, or steady, linear, largely predictable?
4. Which description do you think is closer to the actual behavior of players in your environment:
 - a. they base their behavior on a few simple principles/rules, that limit the scope of decisions that managers can make; within this frame, managers have full discretionary power to make decisions (e.g. Yahoo has two rules for forming alliances: no exclusive deals and the base service, e.g. greetings, must be free for the final users)
 - b. they base their behavior on the detailed analysis of the situation at hand; managers use their extensive tacit knowledge and theoretical knowledge to conduct such analyses

Internal environment: (INT)

1. How does your company generate revenues? What proportion of revenues is generated by particular product/service?
 2. Do you carry out R&D activities? If yes, what kind? What proportion of revenues do you invest in R&D?
 3. How many employees does your company have?
 4. What is the proportion of revenues generated in foreign markets?
 5. How long have you been on the market? How long have you been on international markets?
 6. What is the vision of the company?
1. Relationships with the keystone players
 1. Which platforms of which keystone players do you use as the basis of your offerings?
 2. Why did you decide to use a particular platform? Why did you decide to cooperate with a particular keystone player?
 3. Are you in any way worried, that your company and your activities may be adversely affected by some action by the keystone player? What would (or did) you do in that situation?

4. How did you get access to the platform? How did your way of accessing the platform change in time?
5. Do you in any way influence the development of the platform?
6. Do you assess suitability and quality of the platform? What would (or did) you do, if the platform would become weak (i.e. number and scope of users of offerings based on particular platform would decline)?
7. Do you try to predict how the platform is going to evolve?

2. Integration of the platform

1. When you gain access to the platform, how do you integrate it in your processes (which specific processes do you employ to integrate the platform; how, for example, do you educate people to learn how to integrate the platform; how do you work with the supplier of the platform?)
2. Is your integrative capability unique; in other words, do you integrate platforms better than other niche players?
3. Would your processes change if the platform changed? Has this already occurred? What would you do if it did?

3. Product development

1. How do you develop new offerings on the basis of the platform (what specific processes do you employ for product development)?
2. When you develop new offerings, do you take into account what the keystone players are doing?
3. Do you take into account what other niche players are doing?
4. Do you try to differentiate your offerings from offerings by other players (so that your offerings provide higher value for customers, who are willing to pay for that value)?
5. Which capabilities of the company/people in the company are the most important for the ability to differentiate?

4. Outcomes of the collaboration with the keystone players

1. What do you get out of the collaboration with particular keystone player and use of its technologies?
2. How does the collaboration affect your ability to innovate? How does it affect credibility? How does it affect sales growth?
3. How does it affect the bottom line (what would the bottom line look like without collaboration with the keystone player, how many percents lower would it be)?

APPENDIX 2

Individual responses to the interview questions

Table 1: Practices and processes employed to sense and interpret the environment

Element of sensing and interpreting the environment	Niche player	Managerial practices/processes
Assessment of the quality and suitability of the platform	Alpha	- they pay <u>a lot of attention to that</u> , however their assessment is that Microsoft's development platforms are currently <u>the best in the world</u>
	Beta	- their decision are based on <u>experience</u> and <u>direction of Microsoft's development</u> (they follow Microsoft's direction) - if they determine, that certain Microsoft's direction is not right, <u>they don't follow it</u>
	Gamma	- they <u>don't invest a lot</u> in comparison and assessment of the <u>platforms</u> , <u>they follow global trends</u> and use those platforms that are widely adopted globally
	Delta	- they <u>don't assess quality and sustainability of the platform</u> , as they don't think platform could become inappropriate
	Pi	- <u>development committee</u> in the company <u>assesses development</u> of technologies (including platforms) and recommends <u>introduction of new technologies</u> - they consider assessment as a <u>project risk reducing technique</u>
	Omega	- <u>they asses of the area the vendor is in and its market position</u> ; when doing that they utilize information from Gartner and customers - <u>they are quick to asses new platforms and train their people in new platforms early</u>
Foreseeing the development of the platform	Alpha	- they <u>know</u> what Microsoft will release in the next 2-4 years
	Beta	- it is more <u>following</u> than foreseeing
	Gamma	- they <u>foresee stable technology development</u> of Microsoft's platforms in the next 5 years
	Delta	- they follow technologies, that are <u>2 to 3 years old</u> (»keystone players can not be the only source of information, even they can not foresee market success of particular platforms«)
	Pi	- with Microsoft, they have <u>strategy consultant arrangement</u> ; it enables them to get <u>information on Microsoft's platform development strategy</u> , as well as <u>on-going development</u> - with IBM, there is a different partner program than with Microsoft; they obtain <u>information from IBM labs</u> using web portals and from <u>occasional visits</u> to labs
	Omega	- they <u>follow</u> the keystone players; development roadmap is tied to the roadmap of the keystone players - in some cases, they develop understanding of new platforms <u>ahead of</u> keystone players

Worries with respect to potential adverse effects of some keystones' actions	Alpha	- they <u>do not worry</u> about such activities, since generic Microsoft's applications can not compete with their customized ones - there are some worries since Microsoft is entering new areas (Business Solutions applications)
	Beta	- adverse effects are <u>always possible</u> ; that's why close contact with a keystone player is a must - example of such activity is <u>more active support for more specialized (more attached to Microsoft) niche players</u> than system integrators, that are by definition multi-platform
	Gamma	- <u>keystone players threaten them</u> , because they are moving into system integration services
	Delta	- <u>absolutely worried</u> , since keystone players are becoming serious competition in the area of system integration services
	Pi	- keystone players are moving into system integration services - they are <u>not worried</u> , but they are <u>proactively preparing with strengthening local presence</u> and offering <u>higher value for money</u> with customization - they try to partner with keystone players <u>that don't perform system integration services by themselves</u> - however, Microsoft is <u>careful about actions</u> that might adversely affect its partners
	Omega	- <u>worried in the area of services</u> ; it is a threat, since the keystone players are moving into services
Taking into account keystone players when developing offerings	Alpha	- their development processes are <u>based on</u> Microsoft's development processes
	Beta	- they <u>take into account</u> what Microsoft does since they follow it
	Gamma	- <u>they need to take it into account</u>
	Delta	- <u>they absolutely take it into account</u>
	Pi	- they <u>assess in which markets and technologies</u> are keystone players and <u>where will they move in the future</u> - they <u>adjust to the keystone player's partner model</u> in the area of services - they try to exploit keystone players' development for their own development (e.g. by collaborating on projects)
	Omega	- <u>yes</u> ; they check what keystone player and its partners do - they also <u>check which feature is important enough</u> that it will be included in the core platform - they try to develop offerings <u>on top of the core platform</u>
Taking into account other niche players when developing offerings	Alpha	- <u>yes</u> ; when other niche players move to other markets or technologies, they respond by shifting people between projects
	Beta	- it is <u>necessary</u> , as Microsoft is releasing <u>very basic products</u> , that niche players build on top, that's why it is necessary to take into account and learn

	Gamma	- they take into account <u>the trends</u> ; they don't try to systematically gather information on niche players in the region (there is no time for that)
	Delta	- <u>all the time</u> , they also talk to other niche players
	Pi	- <u>yes, by systematically analyzing the competition</u> - in nearly saturated markets they try to <u>offer more value for money than other niche players</u>
	Omega	- they <u>customize</u> solutions of other partners of the keystone players - they don't go to markets where there is already a lot of players, and to those markets where there aren't many players, however are too strong - they try to <u>partner</u> with other niche players

Source: Own work.

Table 2: Gaining of access to the platform

Niche player	Way of gaining access to the platform
Alpha	- <u>payment</u> of 2.500 USD - in the beginning there was good connection due to <u>academic social networks</u>
Beta	- by <u>start of selling</u> of Microsoft Word and Microsoft Windows
Gamma	- by being a <u>good reseller</u> (reselling a lot of Microsoft products)
Delta	- impulse on the side of Microsoft, through its distributor; <u>cooperation an on innovative project</u> - HP: <u>cooperation on a project</u> ; however, the initial impulse had to come <u>from the niche player</u>
Pi	- the cooperation started when niche player had <u>enough references, trained experts, and sold enough Microsoft products</u>
Omega	- HP: through contact with <u>development teams</u> ; when commercial relationship was established, there were discussions with the <u>EMEA-level</u> people at the <u>specific partner events</u> - Microsoft: contact with the local <u>developers' group</u>

Source: Own work.

Table 3: Motivation to adopt platform and competencies obtained

Niche player	Motivation to adopt platform	Competences obtained
Alpha	- <u>complete platform (infrastructural and development)</u> - <u>advanced platform</u> in the areas they are in - <u>development oriented company</u> - <u>emphasis on development of the ecosystem and consequential low-cost development</u>	- locally: <u>promotion</u> - globally: <u>fast and effective response to technical issues</u>
Beta	- regional start <u>from the same roots</u> , <u>knowledge of integration of operating system</u> Windows, <u>decision to sell software and services</u> (not hardware)	- riding on Microsoft's <u>market influence</u> - help with <u>ability to stay in business</u> - knowledge of <u>partner strategy consultant</u> - <u>joint market plan</u> - <u>partner joint support</u>
Gamma	- commercially motivated decision - <u>opportunity for revenue</u> by selling Microsoft's	- very quick supply of <u>useful information</u> on which technologies and solutions will have the

	<p>products</p> <ul style="list-style-type: none"> - development: very good <u>technical support</u>, platform suitable for <u>wide spectrum of customers</u> 	<p>most market impact; that enables focus on the right things</p> <ul style="list-style-type: none"> - real-time <u>technical support</u>
Delta	<ul style="list-style-type: none"> - Microsoft: <u>good environment and partner support</u> in the sense of <u>low-cost access to the licensed development software</u> - HP: <u>serious keystone player, appropriate prices for niche player's target segment, good support</u> 	<ul style="list-style-type: none"> - <u>credibility</u> - <u>potential new business</u> due to new leads supplied by Microsoft - secondary: <u>access to technologies, communication, training and education</u> - help in <u>the early phase of operations</u>; as a new company, it is easier to start with a help of established keystone player
Pi	<ul style="list-style-type: none"> - Microsoft: <u>successful entry into the Enterprise segment</u> in the last four years; <u>customer demand</u> for Microsoft platforms, lower cost platform for customers - <u>business opportunities, better access to technologies and knowledge of the keystone player, credibility with customers when entering international markets, good partner model, positive attitude of regional representatives</u> - IBM: <u>very good platform</u> for large companies segment; <u>widely adopted platform, most own solutions are developed on that platform</u> - motivation was also assessment, that these two platforms will become <u>dominating</u> 	<ul style="list-style-type: none"> - Microsoft: <u>strengthening of market position and brand image; entry into new market of solutions; knowledge and marketing channels; access to products in the development phase, information on future platform development, access to Microsoft's internal sources, joint entry into international markets, brand impact, counseling, lobbying, education</u> - IBM: reputation of <u>very good vendor of IBM platform-based solutions</u> due to successful deployment of Java applications; <u>opportunity to sell software solutions to providers of infrastructure</u>
Omega	<ul style="list-style-type: none"> - Microsoft: <u>the most popular platform, the largest market share</u> (and consequentially niche player becomes <u>stronger</u> with the customers), <u>good development tools</u> - HP: <u>first customer, the partner they know the best; synergies in the relationship, platforms are suitable for customers needs, opportunity to generate revenue with services, joint go-to-market strategy and joint market activities</u> - IBM J2E: <u>very good technologies, market leading vendor</u> 	<ul style="list-style-type: none"> - Microsoft: <u>larger market, access to the newest technologies, better market impact</u> - HP: partnership with HP helped build the niche player's <u>market position, extensive customer network, platforms as the basis of the offerings</u> - <u>credibility</u> of their solutions, based on HP & MS platforms

Source: Own work.

Figure 1: Platform integration processes

Impulse		Reflection	Expansion of knowledge base
Alpha	- development of new technology by Microsoft	- relatively unconditional decision to expand knowledge base to integrate new Microsoft's platforms	- up-front (before the release of the platform) education of developers using online materials - after release 20% of developers' time dedicated to self-directed education on the platforms
Beta	- recognition that Microsoft's platform development matches perceived customer needs	- plan of training in the next year	- training in keystone players' educational programs - internal hands-on trying of new platforms
Gama	- global trends; which platforms are gaining market impact and need to be integrated	- deliberation on how to acquire knowledge on new platforms - judgment: whether customer will be willing to switch to new platform - judgment: whether keystone player is serious about supporting the platform in the region - judgment: whether there is critical mass of people in the region interested in developing knowledge on the platform	- if all three criteria are fulfilled, education and training in keystone players' educational programs
Delta	- perceived needs of customers' business processes	- assessment of which platform on the market would be most suitable for problem at hand	- training through projects with customers (deliberate choice of projects that promise learning effects)
Pi	- development of new solutions for customers' business needs	- can business solution be re-used - internal "spokesperson" informs the team on properties of new platform - internal pilot project - plan of adoption of new platform (with schedule and milestones)	- lectures and workshops with keystone player - transfer of knowledge of partner strategy consultant
Omega	- explicit customer demand and recognition, that solutions' building blocks might be re-used with multiple customers	development of joint go-to-market plan with the keystone player - plan of competence build-up - ensuring of most competent people on both sides	- training of sales personnel, engineers, marketing staff - internal hands-on trying of the platform - knowledge transfer from keystone player's people

Source: Own work.

Table 4: Development of offerings processes

Niche player	Development of offerings processes
Alpha	<ol style="list-style-type: none"> 1. <u>development of ideas processes</u>: one part of the team generates ideas for <u>solutions for clients</u>, the other part for <u>their product</u>; ideas are generated by the clients or by in-house consultants; outcome: <u>general document</u> that describes functionalities of the solution/product 2. <u>planning processes</u>: development of <u>functional</u> and <u>developers' specification</u> (the former: what, when, who and how can use particular functionality of the product; the latter: how will functionalities be implemented in the solution/product) 3. <u>coding</u> of the product 4. <u>testing and stabilization</u> processes
Beta	<ol style="list-style-type: none"> 1. decision to go ahead with the development on the basis of <u>experience</u> and <u>direction of Microsoft's development</u> 2. development of <u>scenario</u> for clients (scenario = solution for particular business problem, e.g. electronic archiving of the documents) 3. development of the <u>product</u> (combination of keystone players' offerings) 4. organization of <u>events</u> (along with Microsoft) to create perception in the market 5. <u>sales activities</u> (sales through consulting)
Gamma	<ol style="list-style-type: none"> 1. <u>estimation of cost</u> of upgrading current version of the product 2. <u>concurrently training</u> and education in new platform along with <u>market research</u> takes place 3. <u>specification of improvements</u> over current version and their <u>implementation</u>
Delta	<ol style="list-style-type: none"> 1. assessment of <u>needs of clients' business processes</u> 2. <u>deliberation</u> on which <u>products and solutions on the market</u> can be used and <u>integrated</u> to produce customized solution 3. <u>development of solution</u> with constant utilization of knowledge and resources of keystone players
Pi	<p><u>Project management approach</u></p> <p>Before first step: <u>assessment of risk</u> and <u>potential measures</u></p> <ol style="list-style-type: none"> 1. <u>generation of idea</u> and <u>preliminary concept</u> of the project 2. formation of the project <u>team</u> and <u>plan of execution</u> of the project 3. <u>execution</u> of the project /<u>monitoring</u> of the activities 4. search for the <u>moment</u>, when the project outcome is appropriate 5. in the right moment, <u>migration</u> of the project outcome in "production"
Omega	<ol style="list-style-type: none"> 1. an <u>offer</u> is developed on the basis of <u>client's demand</u> 2. development of <u>generic building blocks</u> that can be <u>reused</u> for several clients 3. specification of <u>operational goals</u> of the project along with keystone player 4. organization of <u>events</u>, in which both client and keystone players participate 5. <u>implementation</u> of the solution and <u>after sales</u> activities

Source: Own work.