

5. Design concept for holistic intrapreneurship

In chapter 5, a concept for holistic intrapreneurship is derived from the findings so far which describes the role of intrapreneurship in a global business environment and also gives a design framework that can serve a specific entrepreneurial organisation in a specific (cultural) context. The design framework consists of the role model of an entrepreneurial organisation (see chapter 5.1), a conceptual framework for the global business environment (see chapter 5.2), together with a systems model of a vital entrepreneurial organisation in interaction with the global business environment (see chapter 5.3).

5.1 Role model of the entrepreneurial organisation

Based on the literature study in chapter 3 and the analysis of the three entrepreneurial tasks in a global business environment in chapter 4, a role model for the entrepreneurial organisation (see figure 106) is developed in the following synthesis (Platzek et al 2010)³⁷⁵. In addition, the entrepreneurial roles that have to be fulfilled holistically by the entrepreneurial organisation as a corporate actor³⁷⁶ are identified and described. The implementation of these roles using division of labour takes place for individual entrepreneurial organisations in a way that is dependent on the specific situation³⁷⁷. The company-specific sharing of roles and tasks between all members of the organisation requires a systematic and holistic selection and use of specific talents, an entrepreneurial development of the personnel portfolio (Roffe 1999) and support for cooperative and entrepreneurial teams and team members.

³⁷⁵ The design concept with role model was discussed and presented at the International Scientific Conference Business and Management, May 13-14, 2010, in Vilnius, Lithuania.

³⁷⁶ For the microeconomic concept of the corporate actor see for example Homann and Suchanek (2005), for microeconomics, for example, Morgan (2006) and for an evolutionary perspective Nelson and Winter (1982), who direct their attention less on individual actors and more particularly on the routines in the organisation that have to be permanently modified or replaced to ensure the survival of the organisation in the (selective) environment.

³⁷⁷ According to Wunderer (2006:279) globalisation also enables the global design of external network relationships and cooperations in virtual organisations. According to Draeger-Ernst (2003), all employees should contribute to entrepreneurial orientation if possible.

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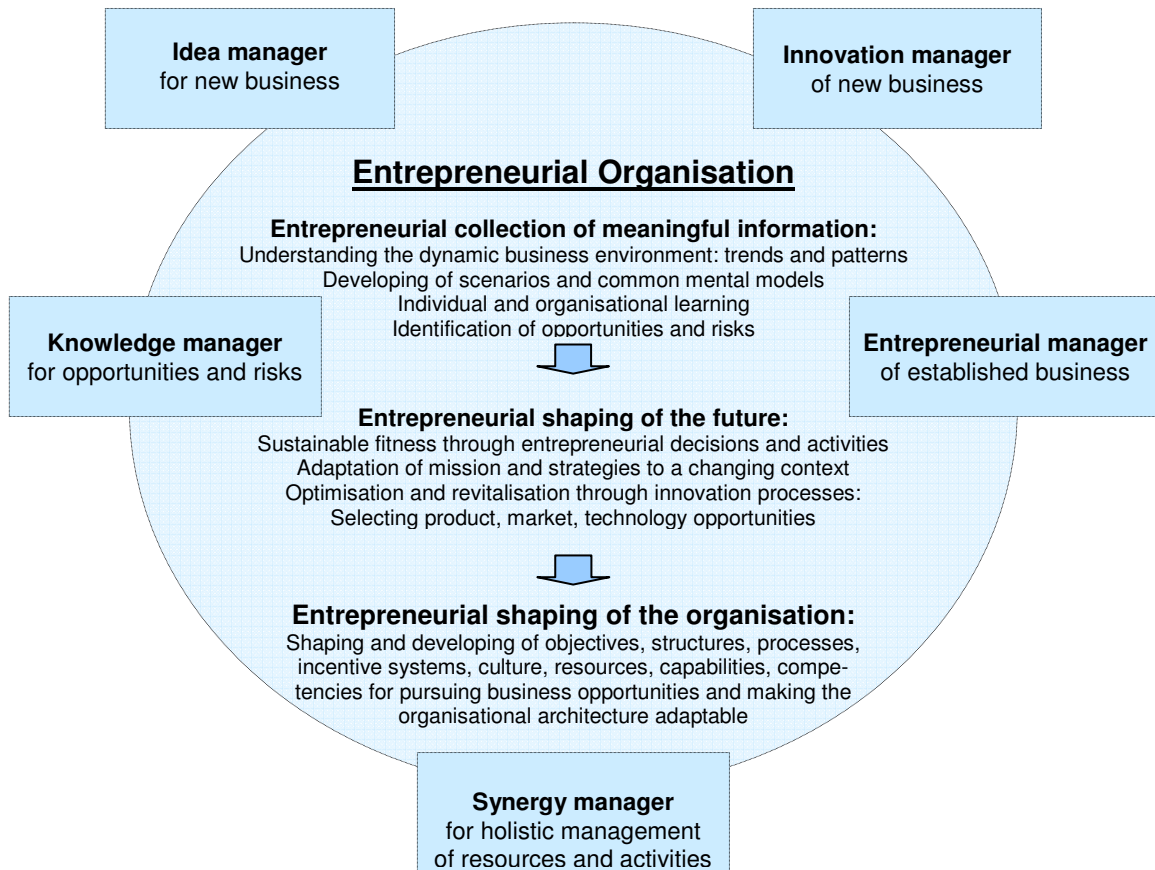


Figure 106: Role model for the entrepreneurial organisation

The role model can be interpreted as a synthesis between the individualistic and the collectivistic approaches of intrapreneurship that one can find in the literature³⁷⁸. It captures several roles of intrapreneurship identified in the relevant work of various authors and in the view of the global competitive business environment in an integrative framework. The role model gives a framework to perform the three entrepreneurial tasks and gives a general orientation to create the entrepreneurial organisation in a specific way and in a specific context.

³⁷⁸ For a discussion of the relationship between individualism and collectivism as a focus of entrepreneurial culture and thus also of the entrepreneurial direction of the organisation, see Morris et al (1993). The authors support the hypothesis that the strongest entrepreneurial orientation is achieved if there is a balance between individualism and collectivism. They specify that, in practice, change in entrepreneurial organisations is very much driven by individual entrepreneurial actors working together with other organisation members. With coalitions, it is possible to pursue mutual targets and individual and collective innovative orientation can be used. Various levels of entrepreneurial action (organisation versus individual) are examined for example by McKenzie et al (2007) taking into account the application of entrepreneurial thinking and action, including outside the economic system.

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The knowledge manager³⁷⁹ collects and analyses systematically relevant information³⁸⁰ about the internal (Johnson and Scholes 1993, Pedler et al 1997, Dess and Lumpkin 2003, Porter 2004b, Hitt et al 2005) and external business environment (Fahey and Narayanan 1986, Graf 1999 and 2000, Palmer 2002, Senge 2003, Porter 2004a, Morrison 2006, Parr Rud 2009) to create, identify, share, apply, and store knowledge (Checkland and Holwell 1998, Krogh et al 2000, Heisig 2009) about customers, suppliers, markets and industries, competitors as well as mental models, trends and scenarios about the general macro environment. This knowledge helps to identify opportunities and risks for new businesses and in established businesses³⁸¹. Individual and organisational learning (Argyris and Schön 1999) from entrepreneurial activities (Block and MacMillan 1995, Argyris 1999) and the working-place (Raelin 2008), crisis (De Geus 2002), the present (Naisbitt 2007) and from the emerging future (Scharmer 2009) also creates knowledge and future options. The knowledge manager needs a global perspective (Thurow 2004), has to link information from different disciplines³⁸² (Palmer and Hartley 2002), and acquires knowledge from external alliance partners (Zhang et al 2010).

³⁷⁹ According to Floyd and Wooldridge (1999), relevant information and knowledge can ensue in particular from the informal exchange between actors who are not necessarily connected. Subjective experience would then also have to become part of collective experience by acceptance of the initiatives so that ideas can in fact be realised via a social network. Knowledge through learning can then come from the entrepreneurial initiatives and experiments. According to Herrmann-Pillath (2002:30-35,346-350), as well as division of labour in production, productive sharing of knowledge for the generation of new knowledge in a dynamic world is also gaining in significance. Entrepreneurial action then must be to a great extent communicative action. Even when the future remains uncertain, according to Saffo (2007), the most important information can be collected and evaluated by complying with six rules: (1) Visualisation of possibilities in the future that result from a certain situation and concentration on probable events (uncertainty diagram); (2) Consideration of changes which at first slowly and from a certain point very quickly determine the success chances of entrepreneurial opportunities (S-curve of development); (3) Events that do not fit into the current picture can be weak signals for big change (openness for contradictions); (4) Openness for adjustment of fixed opinions; (5) Consideration of past events for recognition of templates as a basis decisions focused on the future; (6) Acceptance of dealing with situations where prognoses are barely possible. Following the six rules, it is possible to correctly assess prognoses and identify opportunities and risks.

³⁸⁰ For a comprehensive and practical summary of tools for knowledge management, see Kilian et al (2007)

³⁸¹ Beschoner and Pfriem (2000:16) describe knowledge as today's most important entrepreneurial resource. According to Rathe and Witt (2000), the knowledge acquired is saved in the hierarchy of routines.

³⁸² Holtbrügge and Welge (2010) describe the flow of knowledge between company units in global companies with four types of organisational role templates: (1) *Local innovators* are responsible for the development of locally relevant knowledge; (2) *Implementers* use knowledge from other company units; (3) *Global innovators* make knowledge available to other company units; (4) *Integrating actors* use knowledge from the whole company and make their own knowledge available to other company units. For knowledge transfer between organisations see Martinkenaite (2010).

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The idea manager³⁸³ has to think up new things creatively (Peters and Waterman 1982, Fillis 2010) to recognize and assess opportunities and risks in a discovery process (Smith and Di Gregorio 2002). He can use the information from the knowledge manager for agenda setting and create the match between the idea and the organisational strategy (Andrews 1987) and design (Rogers 2003). To evaluate and select the opportunities, he has to check the feasibility, the economic potential and the fit to strategy (Block and MacMillan 1995). The idea manager can use creativity techniques (De Bono 1989 and 1995, Aerssen 2009), training and publications (Block and MacMillan 1995) or a disciplined and organized process (Drucker 1985) to increase the flow of ideas. He can also use simulation and experiments to find ideas (Andersson et al 2010³⁸⁴). The idea manager has to think systematically about entering new markets and creating new products, services and industries (Kim and Mauborgne 2005).

The innovation manager³⁸⁵ has to consider different types of innovations (Lassen and Nielsen 2009) and different contexts (Ortt and Duin 2008) to design the implementation (Wunderer and Bruch 2000). He has to look for resources, guide the new idea through the stages of implementation (Rogers 2003, Frank 2006) and design the innovation process (Johannessen 2009, Wulfen 2011) cross traditional company boundaries in an innovation arena with cyclic interaction between changes in science and industry, technology and markets (Berkhout et al 2006).

³⁸³ According to Pretorius et al (2005), the relationship between creativity and innovation must be fashioned for the successful realisation of creative ideas. They describe this relationship as an overlapping creative process that connects activities and enables the discovery of an opportunity, the identification of an entrepreneurial idea, the invention of the entrepreneurial activity and the commercialisation of the activity to completion of the innovation. Witt (1987) concerns himself with the search for innovation from the viewpoint of evolutionary economics. For the economics of knowledge in the context of creativity and renewal process, see Geisendorf (2004).

³⁸⁴ In this process, they connect knowledge with entrepreneurship and describe knowledge in action as innovation. Leaders must take care of common targets, cooperation and the entrepreneurial passion of the actors, *Doers* must, as those responsible for entrepreneurial initiatives, organise resources for entrepreneurial opportunities and operational managers have to work on existing business.

³⁸⁵ Kiechl (1990) states that the tasks of finding ideas and implementing them in practice are often associated with each other (Čančer and Mulej 2006). Entrepreneurial actors would mostly implement their own ideas as the spiritual creators. Neugebauer (1997) advocates a separation of the two roles and stresses that implementation of the idea is an entrepreneurial process. For the interplay between creativity and innovation see also for example Struwig (2003). According to Baumol (2002b), a partnership between smaller companies that generate groundbreaking innovations and larger companies that develop the groundbreaking innovations further within the context of innovation routines can be used for systematic innovation. For idea generation in teams see Girotra et al 2010.

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He can use corporate laboratories for product engineering and development (Best 2001). The innovation manager³⁸⁶ has to implement many ideas, because innovation success is a numbers game (Peters and Waterman 1982). He acts in the field of non-routine and often separate from the day-to-day business (Narayanan 2001). The innovation manager can focus internally on strategy, structure, processes, capabilities (organisational rejuvenation, business model reconstruction, strategic renewal) or externally on products and markets (sustained regeneration, domain redefinition) in order to innovate (Morris et al 2008), create an innovation system (Duin et al 2007), and execute new businesses (Govindarajan and Trimble 2005).

The entrepreneurial manager in established businesses³⁸⁷ designs job-sharing, coordination and motivation within the businesses (Picot et al 1997). He has to develop a clear picture of the internal value chain and the costs added at each stage to reveal leverage points for cost reduction – an analogous analysis beyond the organisation points to leverage points in the external business system³⁸⁸ (Abell 1993). Therefore, he has to look at all floating activities of the value chain internally as well as across the organisation to design transparent and efficient relationships inside the firm and with the network partners (Womack and Jones 1997).

³⁸⁶ According to Hartschen et al (2009), the initiation phase, idea finding, idea selection and evaluation as well as the rough concept can be assigned to the idea finder in the context of the innovation process. The implementation concept phase as well the realisation and market introduction can be assigned to the role of the innovation manager (idea implementer). In the role model presented, the innovation manager (idea implementer) is also responsible for the growth phase up until achievement of the innovation. The role of processing of search fields is intended explicitly in the model for the knowledge manager. According to Hartschen et al (2009), market-oriented, competency-oriented or customer-oriented search fields can be determined in the initiation phase. Creativity methods can help with idea creation. In selecting and assessing ideas, strategic considerations should be firmed up into an idea portfolio. By drawing up a rough concept, alternative entrepreneurial activities can be specified and evaluated particularly taking strategic *fit* and cost-effectiveness into account. Internal cooperation, implementation activities and market-specific measures are planned in the implementation concept. In this process, the detailing of products and services, product concepts, market launch concepts and infrastructure and location planning take place to underpin the pursuit of entrepreneurial strategies. The realisation and market entry phase requires high transparency in processes, open communication and cross-divisional agreement. Hartschen et al (2009) see the checking if there is a possibility of multiplication of innovation in other existing or new areas as the last point in the innovation process. This aspect can be allocated to the synergy manager in the role model presented.

³⁸⁷ According to Koontz et al (1980:78-82) the basic tasks are planning, staffing, leading, controlling, coordination. According to Sanchez and Heene (2004:66-121) the focus is on (1) the business concept (who will be served, with what, and how), (2) the organisation concept (resources, organisation design, controls and incentives), (3) the core processes (putting the business concept and organisation concept into action).

³⁸⁸ According to Priddat (2000), the internal and external division of labour can be better organised via market relationships in order to lead employees towards entrepreneurial action and customer orientation.

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The entrepreneurial manager in established businesses also has to create and improve the processes of the organisation in a holistic way, in accordance with the strategy, to create value for customers and to adapt the organisation to external change through learning and redesign of the processes (Hammer 1997). The entrepreneurial manager in established businesses designs its operations and the supply chain with a special focus on flexibility to adapt quickly to a changing and risky business environment and to realize continuous improvements³⁸⁹ to reduce costs and to achieve efficiency (Slack et al 1995, Kaluza and Blecker 2005, Poulter 2006). He optimizes, modifies or increases its existing activities and makes effective decisions to solve basic problems in its businesses (Drucker 2007). The entrepreneurial manager has a strong focus on results and identifies what activities should be ceased (Malik 2000). He makes decisions on outsourcing of value-chain activities and support activities, and creates formal and informal networks to integrate processes (Child 2005).

The synergy manager³⁹⁰ designs job-sharing, coordination³⁹¹ and motivation between departments (Picot et al 1997), between organisations (Wunderer 2006), between subsidiaries and between the subsidiary and its parent organisation (Birkinshaw 2000). He finds a balance between the short-term and the long-term planning in turbulent times (Kotler and Caslione 2009), as well as between the entrepreneurial benefits of decentralization and the benefits of recognizing and exploiting corporate synergies e.g., across product lines in any function or through sharing a (common) resource³⁹² (Abell 1993) and knowledge (Osterloh and Frost 2000b).

³⁸⁹ For idea management and suggestions by employees for improving production and processes see for example Fiedler-Winter (2001).

³⁹⁰ According to Benecke et al (2007), synergy can be described as a concept for value augmentation by the shaping of a holistic organisation system. Within this, top managers have an extremely important role in designing and implementing a vision for synergy within the organisation. Departmentalism and self-interest of actors are often obstacles in the holistic creation of synergies. Entrepreneurial organisation design must support holistic thinking and action and shape the incentive structure in force in such a way that individual and collective interests are harmonised and are in harmony with the targets of the organisation.

³⁹¹ For a prediction of cooperation and behaviour regulation through emotions see Frank (1992).

³⁹² Non-copiable or hard to copy company-specific resource bundles represent the sustainable competitive advantages of an organisation. The unique resource bundles can, for example, be accounted for by the history of the company. A multipersonal anchoring and company-specific embedding secure organisation knowledge.

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He secures the organisation's position in the future³⁹³ through building competencies and realizing entrepreneurial activities which need more resources than a single business unit has (Hamel and Prahalad 1994). He realizes synergies between entrepreneurial activities, as well as between new businesses and established businesses³⁹⁴ (Porter 2004b). The synergy manager has to fulfil three strategic needs - efficiency, innovation, and adaptability – to realize business activities with reference to the changed context in which the businesses operate (Child 2005).

The synergy manager structures effective organisations through the assignment of decision rights within the company, methods of rewarding individuals and the design of systems to evaluate the performance of individuals and units³⁹⁵ (Brickley et al 2004). He has to set the boundaries of the whole organisation (what businesses should it do) and to decide on what basis the organisation should compete to determine the design of the internal organisation (Besanko et al 2007). He creates long-term partnerships with customers and suppliers, links people in different parts of the internal organisation and realizes a *fit* among the strategy, the organisational design and the relevant business environment³⁹⁶ through sorting out which of the identified opportunities the entrepreneurial organisation should pursue (Roberts 2004).

Holistic Intrapreneurship requires fulfilling the five entrepreneurial roles in an integrated manner and in interaction with the external business environment. Thus, it is necessary to focus on the external business arena in the following chapter 5.2.

³⁹³ Stadler (2007) examines long-term successful and large European companies in the past and compares them to less successful companies, identifying four principles of long-term success: (1) Efficiency in existing businesses was more important than innovation for concluding new business; (2) Diversification of operational activities and a broad base of suppliers and customers; (3) Permanent non-repetition of mistakes; (4) Plan and implement changes in small steps. Against the background of examinations thus far, there follows advice concerning dynamic changes in the global business environment which make a differentiated evaluation when taking on recipes for success from the past appear sensible.

³⁹⁴ Bergmann and Daub (2006) combine a stable routine system that is remote from the market with an innovation system close to the market that gives latitude for innovation. Effective routines can be formed and experiences used using competency management. Developments and self-organised learning processes can take place and new opportunities used using innovation.

³⁹⁵ For application of economic concepts in the organisational context see also Nellis and Parker (2002).

³⁹⁶ According to Malik (2000:88-100), holistic thinking is the prerequisite here for entrepreneurial action.

5.2 Conceptual framework to describe and analyse the global business environment

In the current chapter, the synthesis presents a framework to describe and analyse the global business environment and a process model for a holistic view on the three entrepreneurial tasks. The entrepreneurial organisation has to play the entrepreneurial roles (see chapter 5.1) in interplay with its external business environment which is in a permanent state of change. This brings new opportunities and risks as well as the need for adaptation in established businesses. Understanding today's global and dynamic business environment is essential for the entrepreneurial organisation and it is a result of the entrepreneurial collection of meaningful information³⁹⁷. A clear picture of the external business environment helps to develop a common mental model about the business arena and offers a foundation for thinking about the proactive and reactive entrepreneurial activities representing the result of the entrepreneurial creation of the future; the focus is on the exchange between the entrepreneurial organisation and its environment. To realize these entrepreneurial activities it is necessary to design and adapt the internal business environment. The permanently changing business environment makes it necessary to continuously redesign the organisational architecture. A conceptual framework of the business environment helps to create a specific picture of the organisation in its environment to act on the entrepreneurial roles and to pursue the entrepreneurial tasks.

In the literature (see chapter 3.2), there are numerous concepts to describe (Kerr and Littlefield 1974, Weinshall 1977, Fayerweather 1978, Ulrich and Probst 1991, Tepstra and David 1991, Malik 2008) and to analyze (Fahey and Narayanan 1986, Johnson and Scholes 1993, Rugman 2006, Louw and Venter 2006, Daniels et al 2007) the business environment. Some authors focus on the availability of resources for the organisation (Emery and Trist 1965, Aldrich 2008), others on the attributes of the external environment like turbulence, hostility, complexity that determines uncertainty (Khandwalla 1977, Ansoff 2007) and diversity (Trompenaars and Hampden-Turner 1998, Hofstede 2001, Schuster and Copeland 2006).

³⁹⁷ According to Bollmann (2001:16-20), most companies concentrate on internal company processes. In dynamic and global markets, information experts must, however, collect and analyse more information in order to achieve a targetted evolution through planned use of opportunities.

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A common distinction to define the fields of influence and interaction between the organisation and its environment is made between a general (contextual) macro environment and an immediate (operational) micro environment (Worthington and Britton 2000, Hitt et al 2005). The macro environment is built by the political/legal, economic³⁹⁸, sociocultural, technological, and physical segments (Dülfer 1997). The micro environment contains the competitive or industry environment and the task environment of the organisation (Fahey and Narayanan 1986, Porter 2004a).

For the global organisation the local communities³⁹⁹, the nation states⁴⁰⁰, the world regions and the whole world are relevant geographical dimensions of the environment (Graf 2005, Morrison 2006). This makes a systems view on the business environment very useful (Miller 1995, Haines 1998). The internal business environment can be described in particular through processes (Porter 2004b), structures (Mintzberg 1993, Child 2005) and other arrangements like strategy (Porter 2004a), culture (Schein 2003) as well as orientation on optimisation and renewal (Rüegg-Stürm 2004). Ghemawat (2007)⁴⁰¹ classifies countries through cultural, geographical, political and economic differences in comparison with the home location of a company. Global companies have to place their focus on the interplay between local and cross-border interaction if they wish to master challenges in individual countries which are, in turn, part of an integrated world. According to Kanter (2012) participating in the local ecosystem via cooperation in centres of knowledge creation and innovation zones help enterprises to grow.

³⁹⁸ For the analysis of economic segments, economic indicators can be used – see for example Stutely (2006), Roux (2008).

³⁹⁹ Best (2001:69-85) describes an internal/external dynamic between the entrepreneurial organisation and the region and describes this dynamic as *open systems networking*. This brings decentralised phases for the entrepreneurial organisation with entrepreneurial experiments and phases with top-down decisions for internal (production) and external (market) entrepreneurial activities and innovation and development for the region.

⁴⁰⁰ Mets (2006:70-90) points out that particularly in small economies, the success factors of the external and internal business environment should be designed and considered together. Within this, entrepreneurial organisations in smaller economies can use knowledge and competencies as well as cluster infrastructures and technology-based industries (Wong et al 2006) for a permanent entrepreneurial development process. Global companies can use their branches for entrepreneurial experiments and thus provide for efficient processes at the level of the organisation as a whole through coaching and mentoring.

⁴⁰¹ He names three central strategies with which global companies can use country differences in working the market and production: (1) Adapting to regional differences; (2) Aggregation of similar countries in geographical regions to benefit from economies of scale; (3) Arbitrage strategies to use the country difference in order to take profit of absolute cost advantages.

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To get a holistic picture of the global business environment of a specific organisation (see Figure 107), it is necessary to define four dimensions. The first dimension focuses on the geographic areas in which the organisation operates⁴⁰². Environments for operations are the global economy, world regions, nation states and local communities⁴⁰³. The second dimension focuses on the fields for the operational interplay⁴⁰⁴ between the organisation and its environment.

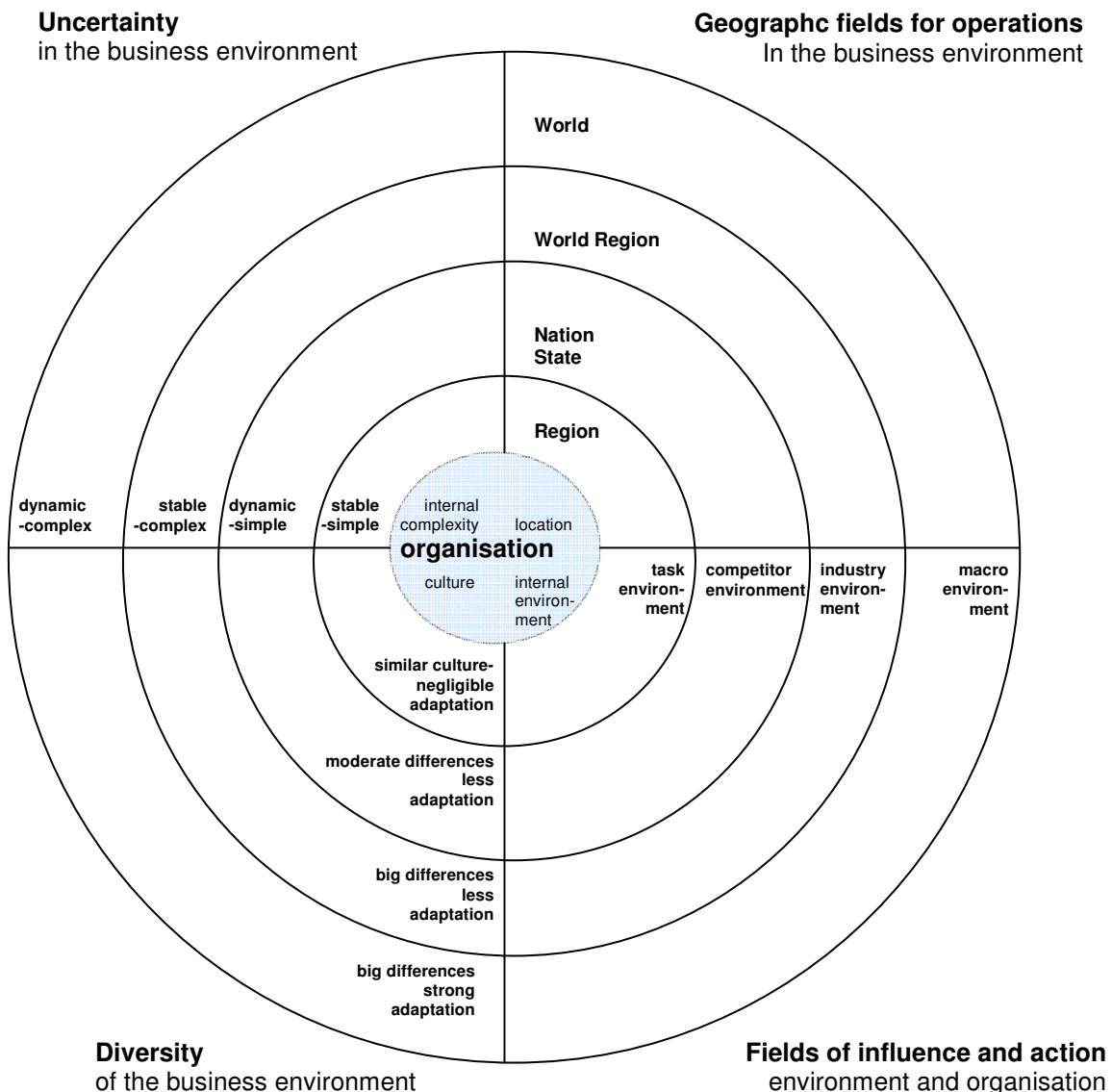


Figure 107: A framework for the global business environment

⁴⁰² For economic location decisions see e.g. Petersen and Lewis (1999).

⁴⁰³ For the role of the local cluster in the innovation process of global entrepreneurial organisations see for example Porter and Sölvell (1998).

⁴⁰⁴ According to Sachs (2000) success in an organisation today is particularly dependent on the ability to anchor itself in economic and society networks (company clusters). Entrepreneurial organisations then drive changes and growth in the region.

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The relevant general macro environment and the specific micro environment define these fields of influence and interaction for the exchange between the organisation and its external business environment. The third and fourth dimensions focus on the attributes of uncertainty and diversity. The entrepreneurial organisation has to assess the cultural diversity and the uncertainty of the business environment (Shrestha et al 2007). This assessment has important implications for the required cultural adaptation of the entrepreneurial activities and the optimisation of the organisational design in several geographic areas. Furthermore, entrepreneurial opportunities can be identified on the basis of cultural differences and the necessary intensity of the organisation's entrepreneurial orientation can be determined with particular reference to the dynamic of the external business environment (Lawrence and Lorsch 1986, Roolath 2006:93-100, Morris et al 2008)⁴⁰⁵.

The conceptual framework presented can provide a vital entrepreneurial learning organisation (Platzek et al 2011b) with a land map for analysis using an inside-outside-inside-approach (see figure 108). The creation of a symbiosis between the vital entrepreneurial learning organisation and the external business environment requires an analysis and shaping of the networking between the organisation and the environment. Thus, the following chapter 5.3 focuses on the exploration of the relationship between the organisation and the external business arena and the exchange of goods, services, and information.

In chapter 5.3.1.1, a total system with 16 internal variables (entrepreneurial organisation) and 16 external variables (global business environment) is introduced. The analysis of this system is done using two methods. Chapter 5.3.1.2 and Chapter 5.3.1.3 sketch a sensitivity analysis to clarify the bilateral relationships and the cybernetic role of the variables. Chapter 5.3.2 presents a qualitative analysis to clarify the basic networking in the system explored and to research a word model and qualitative system model (via aggregation of the total system).

⁴⁰⁵ Gupta et al (2008), define four success factors for a global company: (1) Worldwide identification of market opportunities and working the market as market leader; (2) Transferring global presence into competitive advantages; (3) Use of opportunities from cultural and geographical differences with a global perspective; (4) Focus on (future) global growth markets like China and India.

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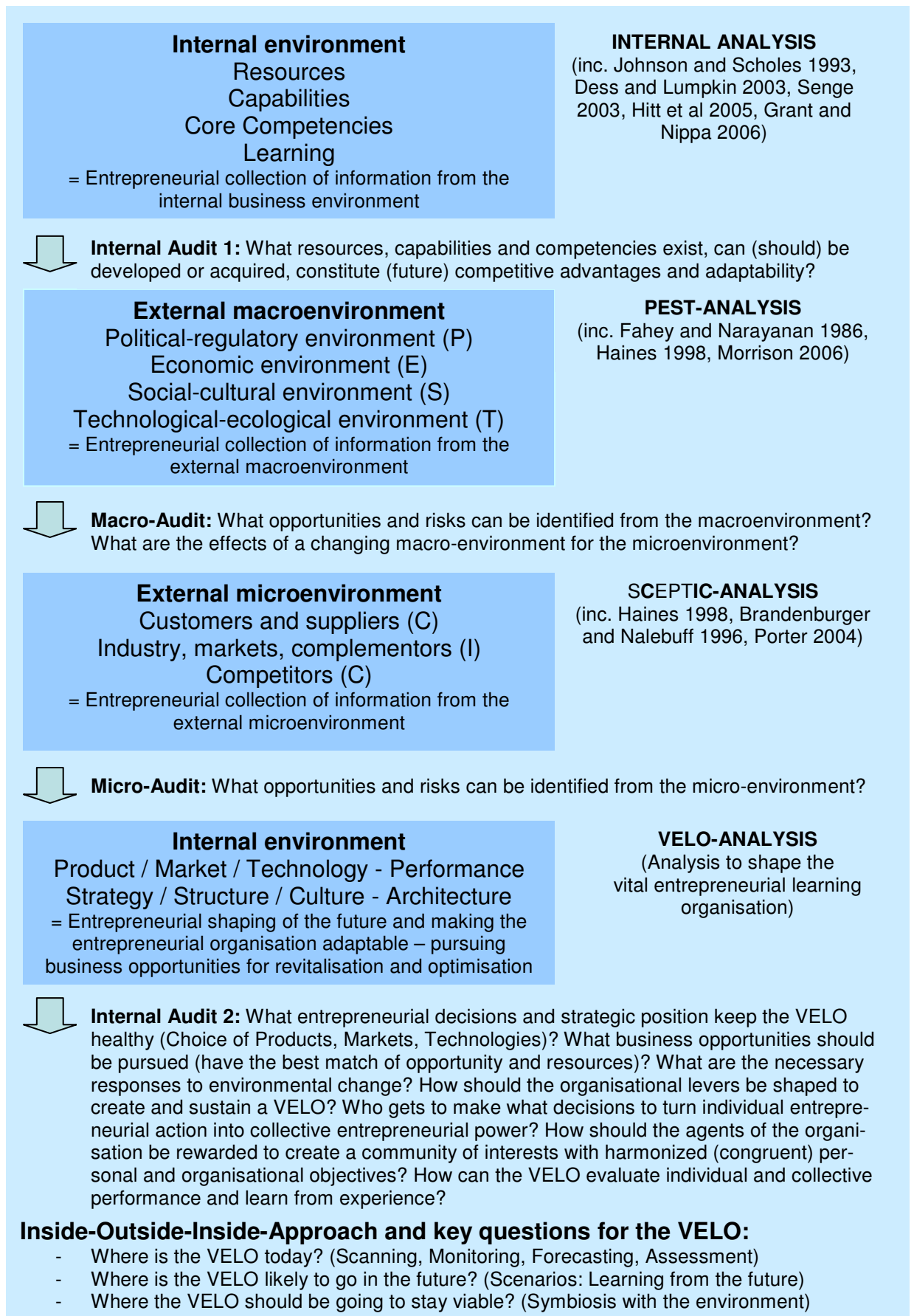


Figure 108: Process model for a holistic view on the three central entrepreneurial tasks of the vital entrepreneurial learning organisation (VELO)

5.3 Networking and interaction between the entrepreneurial organisation and the global business environment

The central focus in this chapter is to explore the interaction between the entrepreneurial organisation and the global business environment. The entrepreneurial organisation shapes the exchange with the external business environment in order to secure viability. In so doing, the viable entrepreneurial organisation takes the internal and external networking into consideration when identifying and implementing entrepreneurial activities. Consideration of the networking and interaction between the entrepreneurial organisation and the external business environment occurs in two steps. Firstly, in chapter 5.3.1, a set of variables for a system model is derived on the basis of findings to date in the literature study (chapters 3 and 4) and this analyses the bilateral activity relationship and outlines the role of the individual system variables. To do this, Vester's sensitivity model is applied⁴⁰⁶. Through aggregation, the system variables are converted into a qualitative system model in a second step (see chapter 5.3.2). The qualitative system model of the viable entrepreneurial organisation shows the fundamental exchange with the external business environment in new and existing businesses.

5.3.1 Bilateral action relationships and the role of system variables

With the sensitivity model, Vester (2005:187-263) develops a guide for dealing with complexity. It is possible with this process for the contexts and the dynamic of a complex system to be made clear at various systems levels⁴⁰⁷. The compilation of a systems model usually begins, in Vester's view, with a brainstorming session of all concerned.

⁴⁰⁶ See Vester (2005) and the corresponding IT tools.

⁴⁰⁷ With this, Vester (2005) develops a tool which, unlike world models (see Forrester 1971, for example), can be applied to various problems. For the sensitivity model, computer-aided tools have been developed with which the behaviour of systems can be challenged and decisions about system influences can be checked. Thus, system compatible measures can be prepared and implemented in specific contexts for the exploitation of opportunities and the avoidance of risks. Vester defines four steps for this: system specification, template compilation, interpretation and evaluation, and strategy. The starting point is then the system specification with the identification of a few representative key factors. On the second level, interactions are examined and system networking visualised. On the third level, there is a system evaluation that takes into consideration the optimisation of viability. In addition, Vester defines eight ground rules for viability (see chapter 3.3.9). On the fourth level, based on the system evaluation, solution strategies are highlighted.

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This way of implementing the systems approach makes it possible for the relevant system to be specified, the effective influencing variables to be investigated and visualised, and the lever for increasing viability of the company system to be identified. With the sensitivity analysis methodology, subjective perceptions can be interactively collected and the sets of variables relevant for the system can be developed. In further work steps, a consensus about the interactions and strength of the influencing factors (see figure 110 and figure 111) can be developed in an influence matrix (see figure 109) and their roles in the systems (see figure 112 and 113). From the analysis of the bilateral activities, a specific picture of the system behaviour and the roles of the individual variables emerges.

In what follows, an alternative implementation of the sensitivity analysis for the general system specification is outlined. On the basis of the literature study, it is possible to develop the steps of the sensitivity analysis (Vester 2005) required for system specification. With this, a general reference system⁴⁰⁸ which can supply initial findings about bilateral activity relations is presented⁴⁰⁹.

5.3.1.1 Entrepreneurial organisation, environment and set of variables

From the literature study (see chapter 3), it is possible, using logical deduction and qualitative examination (Bortz and Döring 1995) and also taking biocybernetic ground rules (Vester 2005) for the optimisation of an entrepreneurial organisation's viability into account, to identify a collection of variables with 32 components for specification of the total system (entrepreneurial organisation and the external business environment). Within this, 16 variables each allude to the entrepreneurial organisation as a corporate actor for the achievement of an entrepreneurial orientation through efficiency, innovation and adaptation, as well as to the global business environment as a playing field for current and future opportunities and risks.

⁴⁰⁸ The reference system for the entrepreneurial organisation takes into consideration the biocybernetic ground rules (and a filtering of the collection of variables with a criterion matrix for checking completeness taking into account life areas, physical and dynamic basic criteria and system relationships) and can thus complement the biocybernetic evaluation with a view to securing viability so that a permanent orientation model is built from the reference system and biocybernetic ground rules for the viable entrepreneurial organisation.

⁴⁰⁹ With this reference system, it is also possible to involve the relevant actors, for example, in the development of a specific company model within a specific context.

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For the entrepreneurial organisation, there is a definition of variables in the four areas of entrepreneurial strategy, entrepreneurial structure, entrepreneurial culture as well as resources and competencies. Through globalisation, global networking of the general business environment is continuously determining the development possibilities of global companies. Their operation fields are determined by specific local situations and micro environments. For the global business environment, there is a definition of variables in the four areas of the global general business environment, local general business environment, industry and competition environment, together with the task environment. These variables describe the total system (entrepreneurial organisation and external business environment). They are categorised and include the following:

The corporate actor: entrepreneurial organisation

Entrepreneurial strategy⁴¹⁰

1. Entrepreneurial activities in existing businesses to secure efficiency⁴¹¹
2. Entrepreneurial activities for market innovation processes to strengthen strategic effectiveness⁴¹²
3. Evolution of the objectives and mission (the system identity)⁴¹³ for securing the long-term viability and orientation towards selected community values

Entrepreneurial structure⁴¹⁴

4. Viable organisation design⁴¹⁵
5. Harmonious incentive structure⁴¹⁶
6. Development-oriented and learning structures that promote adaptability⁴¹⁷

⁴¹⁰ See chapter 4.3.1 and Tichy (1983), Mintzberg (1991a), Abell (1993), Porter (2004a), Ireland (2009)

⁴¹¹ In particular the design of the Input-Output relationship, regulation processes and technological adaptation as a reaction to changes in the business environment.

⁴¹² In particular market research, technological research and development, product adaptation, product portfolio adaptation, adaptation of way of working the market, structural change with new products and new markets via processes of self-organisation and use of internal dynamics for the preservation of identity/ fulfilment of mission.

⁴¹³ According to Stöger (2009), organisations have to change their company purpose if the rules of play in the markets and demand change fundamentally. Thus, the central questions for a company have to be reconsidered after a crisis.

⁴¹⁴ See chapter 4.3.2 and particularly Argyris (1957), Beer (1979, 1995), Belbin (1996), Morgan (1998), Bartlett and Ghoshal (2002), Senge (2003), Brickley et al (2004), Child (2005)

⁴¹⁵ Particularly entrepreneurial management structures with central and decentralised decision structures, flexibility, division of labour, systems and (production) processes, synergies, holographic (constant, extendable) structures with free resources for innovation, decisions about company boundaries and the cooperation in virtual organisations and alliances - see chapters 3.3.4 and 4.3.2.1 as well as Mintzberg (1979:285-287) and Schanz (1994).

⁴¹⁶ Particularly harmonisation of interests between individual actors and the organisation and harmonisation of short-term and long-term orientation amongst the actors (see chapter 4.3.2.2).

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Entrepreneurial culture⁴¹⁸

7. Distinctive information culture
8. Open communication culture
9. Trusting culture of cooperation
10. Dynamic innovation culture (that promotes creativity and implementation)
11. Culture that promotes identification and motivation
12. Individual and organisational learning culture

Resources and competency-*fit*⁴¹⁹ for the processing of current and future opportunities and risk for the implementation of the entrepreneurial strategy

13. Human resources-*fit*⁴²⁰
14. Company resources-*fit*⁴²¹
15. Intangible resources-*fit*⁴²²
16. Strengths, weaknesses and core competencies of the organisation-*fit*⁴²³

The operation field: current and future external business environment as a source for opportunities and risks⁴²⁴

Global general business environment⁴²⁵

17. Changes in global economic framework conditions⁴²⁶
18. Changes in global technological framework conditions⁴²⁷

⁴¹⁷ Particularly development and adaptation of common mental models, structures for individual and collective learning, exchange of knowledge and application for entrepreneurial activities.

⁴¹⁸ See chapters 3.3 and 4.3.2 as well as Kobi and Wüthrich (1986), Kotter and Heskett (1993), Schein (2003), MacDonald (2008), Stadler (2009)

⁴¹⁹ See chapter 4.3.1 and particularly Andrews (1987), Penrose (1995), Sanchez and Heene (2004), Hitt et al (2005), Wunderer (2006)

⁴²⁰ Particularly, a workforce with entrepreneurial orientation and individual entrepreneurial competencies in decentralised units and in top management, staff recruitment and employee development for the implementation of future entrepreneurial strategies.

⁴²¹ Particularly, taking physical resources into account (e. g. production systems, locations, logistics) and financial resources (sources and use of capital and intracapital).

⁴²² Particularly taking into account the company image and brand names, relationships and networks.

⁴²³ Particularly taking into account the current and future core competencies to secure or achieve competitive advantages and for the analysis of strengths and weaknesses to make use of opportunities and encounter risks.

⁴²⁴ Particularly the character of the relevant business environment taking into account networking, dynamic, complexity, diversity and extension of the operation fields (world, economic region, countries, regions).

⁴²⁵ See chapter 3.2 (particularly chapter 3.2.2.6, world and economic region levels of analysis) and particularly Rugmann and Collinson (2006), Dülfer and Jöstingmeier (2008), Morrison (2006), Graf (2005), Stiglitz (2010)

⁴²⁶ For example global economic development, globalisation of real markets, global finance architecture.

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- 19. Changes in global political and legal framework conditions⁴²⁸
- 20. Changes in global socio-cultural and societal framework conditions⁴²⁹
- 21. Changes in ecological framework conditions and the natural environment⁴³⁰
- Local general business environment⁴³¹
 - 22. Changes in local economic framework conditions and location qualities⁴³²
 - 23. Changes in local technological framework conditions⁴³³
 - 24. Changes in local political and legal framework conditions⁴³⁴
 - 25. Changes in local socio-cultural and societal framework conditions⁴³⁵
 - 26. Changes in local ecological framework conditions, the natural environment and the geographical situation⁴³⁶
- Industry and competitive environment⁴³⁷
 - 27. Changes in the industry environment and industry life cycle
 - 28. Changes in the competition situation and position⁴³⁸
- Task environment⁴³⁹
 - 29. Changes on the customer side⁴⁴⁰
 - 30. Changes on the supplier side⁴⁴¹
 - 31. Changes on the financial market⁴⁴²
 - 32. Changes on the personnel market⁴⁴³

⁴²⁷ For example international patent protection, global research associations, globally available technology status.

⁴²⁸ Particularly taking account of global institutions such as WTO, IMF, UNO (see chapter 3.2.2.6).

⁴²⁹ For example also in the implementation of human rights or international work standards, demographic development, corruption and criminality.

⁴³⁰ For example examination of the effects of climate change.

⁴³¹ See chapter 3.2. (particularly chapter 3.2.2.6, economy and local market levels of analysis) and particularly Fahey and Narayanan (1986), Mets (2006), Daniels et al (2007).

⁴³² For example, the design of economic structure change, finance market regulation and of the interplay between the state and the economy.

⁴³³ For example, technology clusters and national (comparative) advantages.

⁴³⁴ For example, the design of the health system and energy policy.

⁴³⁵ For example, dealing with demographic change.

⁴³⁶ For example, dealing with climate change (Porter and Reinhardt 2007).

⁴³⁷ See chapter 3.2 and particularly Vernon (1966), Andrews (1987), Porter (2004a).

⁴³⁸ Particularly current and potential competitors, market entry barriers, current and potential competitive products, threats by substitutes, global competition, positioning.

⁴³⁹ See chapter 3.2 and particularly Ulrich and Fluri (1995), Slack et al (1995), Brandenburger and Nalebuff (1996).

⁴⁴⁰ For example, globalisation of the product markets, market power of the customers.

⁴⁴¹ For example, global sourcing, market power of suppliers.

⁴⁴² For example, capital access, finance conditions.

⁴⁴³ For example, availability and mobility of the employee, location selection and relocations by the employer.

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To analyse the system, it is useful to apply the method of the sensitivity analysis (Vester 2005). The first step in the research process is to value the bilateral influences between the variables (see chapter 5.3.1.2). The second step is to identify the (buffering, critical, active, reactive) role of the variables⁴⁴⁴ (see chapter 5.3.1.3) to get a first impression of the networking between organisation and environment.

5.3.1.2 Entering data into the system with the influence matrix: interactions between the system variables

The influence matrix⁴⁴⁵ challenges the bilateral action relationships. In addition, the strength of the effects of change of a variable on all other variables is assessed (see Ulrich and Probst 1991:143). The effect is evaluated with values between 0 and 3. If variable B changes significantly due to a weak influence by variable A, this is assigned with a value of 3 (strong relationship). If the changes are equal, a value of 2 is assigned (medium relationship). If variable B changes only slightly due to the effect of a strong influence of variable A, a value of 1 is assigned. If there is no apparent effect, little effect or if there is a long time delay, a value of 0 is assigned (no relationship). The influence of a variable on all other variables is represented by the row of that variable (active sum). The column of a variable shows how intensively that variable is influenced by the other variables (passive sum). A variable with a high active sum (AS) has a bigger leverage effect on the system. A variable with a high passive sum (PS) changes significantly if something in the system changes. Taking into account findings from the literature study and action research, values for the influence matrix of the presented total system (see chapter 5.3.1.2) can be ascertained (see figure 109) and a system evaluation can be implemented by an evaluation of the influence matrix and by looking at the active and passive sum of all variables (see figure 110).

⁴⁴⁴ Vester (1990:37) describes four combinations of influences: (1) Variables which strongly influence the other variables, but are weakly influenced by the other variables (active variables); (2) Variables which weakly influence the other variables, but are strongly influenced by the other variables (reactive variables); (3) Variables which strongly influence the other variables and which are strongly influenced by other variables (critical variables); (4) Variables which weakly influence the other variables and which are weakly influenced by other variables (buffering variables). According to Ulrich and Probst (1991:145) this classification helps to identify levers to shape the situation.

⁴⁴⁵ Vester (2005:195) describes this work tool for networked thinking, originally developed in 1970, as a *paper computer* or *cross-impact-matrix*.

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Influence of variable to variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	AS	P	
1 Innovation in operations	X	1	1	2	2	2	2	2	2	2	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	1	33	1452
2 Innovation in markets	1	X	2	2	2	2	2	2	2	3	3	3	3	2	2	2	0	0	0	0	0	0	1	1	1	1	1	3	3	3	3	3	2	56	3640
3 Organisational evolution	1	3	X	2	2	2	2	2	2	3	3	3	2	2	2	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	45	2835	
4 Organisational design	2	2	2	X	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	1350	
5 Incentive structure	2	1	1	2	X	1	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	1161
6 Learning structure	1	3	2	2	X	2	2	2	3	2	3	2	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	1505
7 Information culture	2	2	2	2	2	X	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	1110	
8 Communication culture	2	2	2	2	2	2	X	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	1110	
9 Cooperation culture	3	3	3	2	2	2	2	X	2	2	3	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	1360	
10 Innovation culture	2	3	3	3	3	2	2	X	2	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1720	
11 Guiding culture	2	2	2	2	2	2	2	2	X	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	1140	
12 Learning culture	2	3	3	2	2	3	2	2	3	3	2	X	3	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	1558
13 Human Resources	3	3	3	2	2	2	2	3	3	3	3	X	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	41	1886	
14 Tangible Resources	2	2	2	2	2	2	2	2	2	3	2	2	X	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	32	1344	
15 Intangible Resources	2	2	2	2	2	2	2	2	3	2	2	2	X	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	32	1440	
16 Competencies	3	3	3	2	2	2	2	2	2	2	2	2	2	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	34	1326	
17 Global economy	0	1	2	1	0	0	0	0	1	0	0	0	0	0	0	0	X	2	1	1	2	2	2	1	1	1	2	2	2	2	2	2	2	30	600
18 Global technologies	0	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	2	X	1	1	1	1	2	1	1	1	2	2	2	2	2	2	2	28	532
19 Global regulatory system	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	X	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	304
20 Global society	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	X	2	1	1	1	1	1	1	1	1	1	1	1	1	19	304
21 Natural Environment	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	X	1	1	1	1	1	2	1	1	1	1	1	1	19	342
22 Local economy	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	X	2	1	1	1	2	2	2	2	2	2	2	27	513
23 Technology clusters	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2	1	1	1	2	X	1	1	1	2	2	2	2	2	1	2	27	540
24 Local regulatory system	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	X	1	1	2	2	2	2	1	2	23	391	
25 Local society	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	X	1	2	2	2	2	1	2	23	391	
26 Local geographic situation	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	X	2	2	2	2	1	2	32	544	
27 Industry situation	2	3	3	2	2	2	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	X	3	2	2	2	2	48	1632	
28 Competitive situation	3	3	3	2	2	2	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	X	2	2	2	2	48	1680	
29 Product / Service markets	3	3	3	2	2	2	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	X	2	2	2	2	48	1680	
30 Factor markets	3	2	2	2	2	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	X	2	2	2	45	1575	
31 Financial markets	2	2	2	2	2	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	X	2	2	45	1395	
32 Labour markets	2	2	2	2	2	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	X	45	1485		
	44	65	63	45	43	43	37	40	43	38	41	46	42	45	39	20	19	16	16	18	19	20	17	17	17	34	35	35	35	35	31	33	PS		
	75	86	71	67	63	81	81	81	85	93	79	93	89	76	71	87	150	147	119	119	106	142	135	135	135	188	141	137	129	145	136	Q x 100			

Figure 109: Influence matrix for networking of an entrepreneurial organisation with the global business environment⁴⁴⁶

The market innovation variable (number 2) features a very high active sum with regard to the entrepreneurial organisation. Thus, it is possible here to identify a highly proactive lever on the system: market innovation strongly influences the other variables and therefore the total system. The organisational evolution (number 3), innovation and learning culture (number 10, 12) and human resources variables (number 13) also exhibit high active sums. Thus, it becomes clear according to this analysis that the strategic variable of market innovation and organisational evolution, supported by an innovation and learning culture, and human resources, can particularly represent a proactive entrepreneurial orientation (see figure 110).

In terms of the global business environment, looking at the active sum of the relevant variables (number 17 to 32) it becomes clear that changes in the micro environment in particular determine the dynamics of the system (see figure 110): Changes in the industry (number 27), competition (number 28) and task environments (product and factor markets, number 29, 30, 31, 32) require the entrepreneurial organisation to have a strong, active market orientation. The variables of market innovation (number 2) and organisational evolution (number 3) can be identified as variables with high passive sums (see also figure 110).

⁴⁴⁶ The Q-Value (Q) is the quotient of active sums (AS) to passive sums (PS). The P-Value (P) is the product of active and passive sums.

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Thus, these two variables are strongly influenced by the other variables and therefore by changes in the total system. Further examples of high passive sums are operational innovation (number 1) for the strengthening of efficiency, tangible (number 14) and intangible company resources (number 15) and human resources (number 13). Further levers for reactive adaptation are organisation design (number 4), incentive (number 5) and learning structures (number 6) together with an innovation (number 10) and learning culture (number 12). The macro and micro environment are less influenced by the system than they influence the system. Within this, the micro environment exhibits a greater reactive dynamic than the macro environment. The information (number 7) and communication culture (number 8) are driven by events in the system.

Overall, it becomes evident (see figure 110) that changes in the global business environment have greater effects on the entrepreneurial organisation (the variables 17 to 32 have a higher active sum than passive sum) vice-versa (the variables 1 to 16 have a higher passive sum than active sum) and thus require a strong adaptive orientation in the entrepreneurial organisation. At the same time, the potential of proactive entrepreneurial activities to strengthen viability (high active sum of the variables 2, 3, 10, 12, 13) and the dynamic forces of the micro environment (high active sum of the variables 27 to 32) becomes clear.

Amount (active)	List of variables	Amount (passive)
	1 Innovation in operations	44
56	2 Innovation in markets	65
45	3 Organisational evolution	63
	4 Organisational design	45
	5 Incentive structure	43
	6 Learning structure	43
	7 Information culture	37
	8 Communication culture	37
	9 Cooperation culture	40
40	10 Innovation culture	43
	11 Guiding culture	38
	12 Learning culture	41
41	13 Human Resources	46
	14 Tangible Resources	42
	15 Intangible Resources	45
	16 Competencies	39
	17 Global economy	20
	18 Global technologies	19
	19 Global regulatory system	16
	20 Global society	16
	21 Natural Environment	18
	22 Local economy	19
	23 Technology clusters	20
	24 Local regulatory system	17
	25 Local society	17
	26 Local geographic situation	17
	27 Industry situation	34
48	28 Competitive situation	35
48	29 Product / Service markets	35
45	30 Factor markets	35
45	31 Financial markets	31
45	32 Labour markets	33

Figure 110: Table of strength of influence within the sensitivity analysis for networking the entrepreneurial organisation with the global business environment

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An entrepreneurial strategy taking into consideration *market innovation* for the development of new business and *organisation evolution* for strategic renewal is particularly supported by an *innovative culture* and *human resources* (high active and passive sum – see figure 110). Active sums and passive sums can be examined in combination for a further assessment of the variables (see Vester 2005:230-232) in the search for directional levers for the total system. The relationship (quotient) of active to passive sums (see also figure 109) reflects the active or reactive character of a variable (Q-Value), i.e., whether a variable within the system has something active to say or rather, whether they follow changes (reactive). The product of active and passive sums (P-Value) gives a clue to the contribution of a variable to the system's behaviour (see also figure 109). The higher the product, the more influence the variable has on the system (critical). The lower the product, the less the variable influences the system (buffering). Figure 111 shows the respective influence index of the system components from the theoretical exploration in this research via a sensitivity analysis for networking the entrepreneurial organisation with the global business environment.

ACTIVE	REACTIVE	Q-Value	CRITICAL	BUFFERING	P-Value
Highly active			Highly critical		
			2 Innovation in markets		3640
			3 Organisational evolution		2835
Active			Critical		
	26 Local geographic situation	1,88	13 Human Resources		1886
Little active			10 Innovation culture		1720
	17 Global economy	1,50	28 Competitive situation		1680
	18 Global technologies	1,47	29 Product/Service markets		1680
	31 Financial markets	1,45	Little critical		
	22 Regional economy	1,42	27 Industry situation		1632
	27 Industry situation	1,41	30 Factor markets		1575
	29 Product/Service markets	1,37	12 Learning culture		1558
	28 Competitive situation	1,37	6 Learning structure		1505
	32 Labour markets	1,36	32 Factor markets		1485
	24 Local regulatory system	1,35	1 Innovation in operations		1452
	25 Local society	1,35	15 Intangible Resources		1440
	23 Technology clusters	1,35	31 Financial markets		1395
Neutral			9 Cooperation culture		1360
	30 Factor markets	1,29	4 Organisational design		1350
	19 Global regulatory system	1,19	14 Tangible Resources		1344
	20 Global society	1,19	16 Competencies		1326
	21 Natural environment	1,06	5 Incentive structure		1161
	10 Innovation culture	1,06	Neutral		
	12 Learning culture	0,93	11 Guiding culture		1140
	13 Human Resources	0,89	8 Communication culture		1110
	16 Competencies	0,87	7 Information culture		1110
	2 Innovation in markets	0,86	Weak buffering		
	9 Cooperation culture	0,85	17 Global economy		600
	6 Learning structure	0,81	26 Local geographic situation		544
	7 Information culture	0,81	23 Technological clusters		540
	8 Communication culture	0,81	18 Global technologies		532
	11 Guiding culture	0,79	22 Local economy		513
	14 Tangible Resources	0,76			
	1 Innovation in operations	0,75			

Figure 111: Influence index in the sensitivity analysis for networking the entrepreneurial organisation with the global business environment

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Market innovations, organisational evolution, human resources, innovation culture, competition and the product markets are important for the system's behaviour. In chapter 5.3.1.3, the next step of the research is carried out in order to describe the attributes of the variables in the total system (entrepreneurial organisation and environment) using a two-dimensional diagram with the active and passive sum of the variables.

5.3.1.3 The role of the key variables in the system

It is possible to establish the position of each individual variable and see what the effect on the system in focus is (active, passive, critical or buffering)⁴⁴⁷. With this, critical points and levers can be identified, the character of the system can be observed and hints on strategy can be derived⁴⁴⁸. The general cybernetic interpretation of role distribution of the relevant position in a system is shown in figure 112.

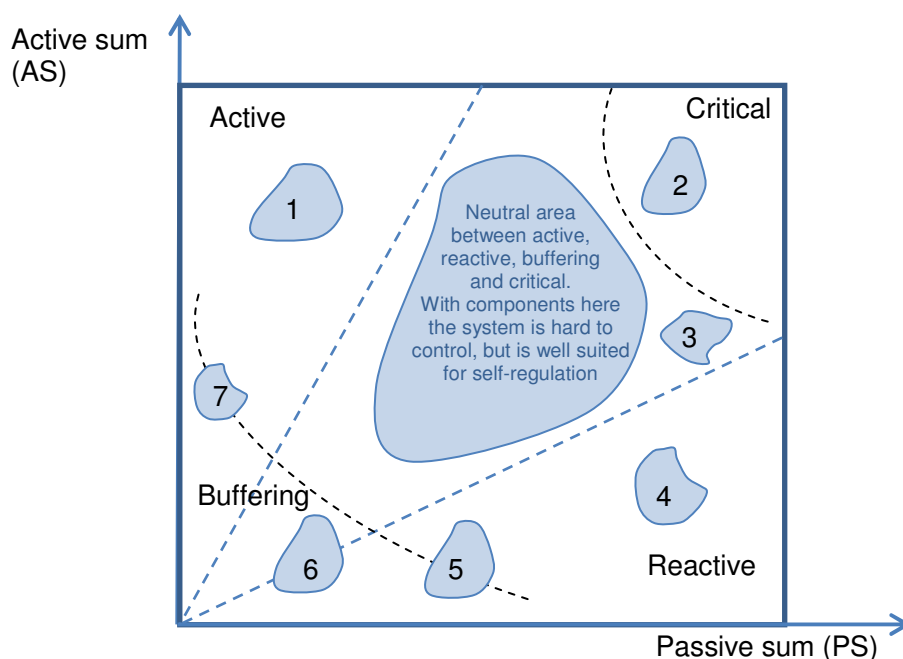


Figure 112: Interpretation of role distribution according to Vester⁴⁴⁹

⁴⁴⁷ According to Vester (2005:234-238) the 50 fields each have a general description by way of a cybernetic illustration allocated to them. The positions of the individual variables result from the total network so that each variable receives a special position.

⁴⁴⁸ According to Vester (2005:195) in specific cases and using interactive workshops, this evaluation gives indications for a (recursive) correction of the choice and definition of the variables.

⁴⁴⁹ Vester (2005:235). Interpretation: 1st area for shift levers which stabilise the system following a successful change; 2nd area for accelerators and catalysators that are suitable for starting things off as initial igniters; 3rd Critical-reactive area; 4th area of cosmetic corrections (treatment of symptoms); 5th area of agent indicators, suited for experiments; 6th area of unnecessary involvement; 7th area of weak shift levers with few side effects.

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The sensitivity analysis in this research for networking the entrepreneurial organisation with the global business environment shows that the internal variables market innovation (number 3), organisational evolution (number 3), human resources (number 13) and innovation culture (number 10) are critical for the development and regulation of the presented system (see figure 113). These variables can be used for initial ignition and as an accelerator for development of the organisational system (high active sum) as well as for adaptation (high passiv sum) to a changing competitive situation (number 28) and dynamic product or service markets (number 29). Location decisions and conditions are important for activities (number 26).

With the sensitivity analysis thus far, it was possible to describe the individual components of the networking between the entrepreneurial organisation and the business environment and to clarify the role of the individual variables. This framework can be used to determine the components and their role in specific cases and to develop a specific interrelationship⁴⁵⁰. In the next chapter, the interplay of all relationships is described. This research process uses a qualitative framework and a method of aggregation to compact the system (Bossel 2004).

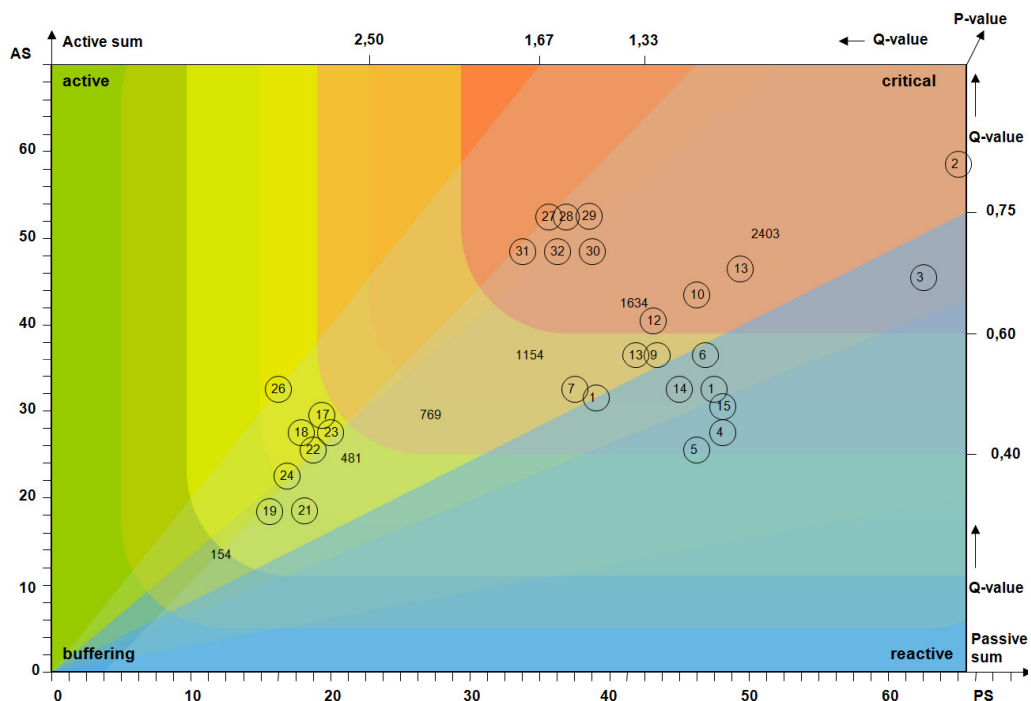


Figure 113: Role distribution of variables in the sensitivity analysis for networking the entrepreneurial organisation with the global business environment

⁴⁵⁰ For an examination of interrelationships with effect chains and feedback in the framework of the sensitivity model see Vester (2005:239-263).

5.3.2 Reduction of complexity and qualitative system model

On the basis of the considerations and examinations in the previous section, in the following section the fundamental relationships for reducing the complexity of the system specification are investigated through aggregation and transfer them into a qualitative system model via a word model⁴⁵¹. Additionally, a word model is formulated in section 5.3.2.1 and the fundamental system relationships are outlined; in section 5.3.2.2, a qualitative system model is derived.

5.3.2.1 Statement of problem, purpose of model and reduction of complexity

To specify the interaction and networking between the organisation and the environment on an aggregate level and to clearly show the lever for intrapreneurship, this section outlines a qualitative system model of the viable entrepreneurial organisation in a dynamic global business environment. In order to secure viability, entrepreneurial organisations recognise and shape the networking of the organisation with the environment (externally produced dynamic) and the momentum within the organisation (internally produced dynamic)⁴⁵².

In terms of implementing entrepreneurial strategy, the entrepreneurial momentum is particularly supported by the four levers for intrapreneurship, these being entrepreneurial strategy, entrepreneurial structure, entrepreneurial culture, and (current and future) resources and competencies.

⁴⁵¹ This procedure is focused on Bossel (2004).

⁴⁵² For fundamental systems dynamics see, inter alia, Bossel (2004:40-50,231-250). To secure the viability of an organisation, he defines six basic key values which accord with the characteristics of the system environment: 1. The key value of *existence* in the normal (relatively stable) environment requires the organisation to realise a purpose for the system; 2. The key value of *effectiveness* in an environment of scarce resources requires efficiency from the organisation in its own processes and in its interaction with the environment; 3. The key value of *freedom of action* in an environment characterised by variety requires a variety of (decentral) behaviours from the organisation in order to be able to react to various challenges; 4. The key value of *security* in an environment characterised by insecurity from random fluctuations requires extensive independence from unstable environmental factors and adaptations in internal processes as well as shaping the external environment; 5. The key value of *ability to change* in an environment characterised by change requires from the organisation conduct and structure changes or also changes of identity for the securing of viability and development of the organisation; 6. The key value of *co-existence* in a world with network structures with division of labour and partnerships requires from an organisation consideration of the interests and development of their partner in their own behaviour. In order to secure long-term viability and development competence, organisation systems must fulfil all key values to the minimum degree so that the key values and assistance with decisions for designing entrepreneurial organisations can be used.

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The qualitative model describes this networking and momentum and shows how the entrepreneurial organisation uses networking and interaction so that it can seize chances and counter threats from the external business environment. With this, the exploration shows how entrepreneurial activities secure the viability of the organisation in synergy with the business environment taking into account feedback loops for the achievement of a stable dynamic. The following model⁴⁵³ for further discussion also imparts orientation knowledge for the specific dynamic design of an entrepreneurial organisation in a business environment in change. The dynamic and networked global business environment presents opportunities and threats for an entrepreneurial organisation. To secure the organisation's viability in a complex business environment, the organisation has to develop its interaction with the environment in a focused way and use the existing network. Development of the four internal levers of strategy, structure, culture and (current and future) resources and competencies promotes a momentum inside the organisation and also promotes the entrepreneurial orientation of the organisation and its actors. The entrepreneurial actors (in decentralised units, top managers) pursue opportunities and threats from the dynamic business environment.

The entrepreneurial organisation can exploit its internal entrepreneurial momentum together with changes in the external business environment for proactive and reactive entrepreneurial activities. The viability of the organisation can be retained as a permanent feature by dynamically exploiting opportunities and countering threats in synergy with the external business environment. The characteristics of the business environment determine the design of the four levers and the required intensity of the organisation's entrepreneurial orientation. The business environment can be sub-divided into a micro environment and a macro environment. For the purposes of the analysis, the general macro environment can be sub-divided into the four segments of political-legal, socio-cultural, technological and economic framework. The dynamic of change is driven by globalisation and technological developments. The micro environment is divided into the industry, competition and task environments.

⁴⁵³ This procedure goes back to Bossel (2004), who describes such a model as *word model*.

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The industry and competition environments can be sub-divided into segments of market entry barriers, threats from substitution, industry life cycles and product life cycles. The task environment can be sub-divided by the parameters of the market power of suppliers, market power of customers, the financial market and the labour market. The general macro environment has a particular influence on the industry, the competition environment and the task environment and, also via the formation of common mental models of the macro environment, on the organisation. The micro environment represents an external operational field for entrepreneurial activities in existing businesses and a source of new opportunities and risks which interacts directly with the entrepreneurial organisation.

For the reduction of complexity, the following eight fundamental system elements can be identified from the system specification, applying aggregation:

1. General macro environment (globalisation, technological development);
2. Specific micro environment: Industry, competition and task environments (competitive pressure);
3. Opportunities (and threats) for new entrepreneurial activities (renewal);
4. Threats (and opportunities) for existing businesses (optimisation);
5. Entrepreneurial activities of decentral units;
6. Entrepreneurial top management;
7. Entrepreneurial momentum (strategy, structure, culture, current and future resources and competencies);
8. Viability of the organisation;

It is possible to define 16 direct activity relationships within the individual elements:

1. Changes in the general business environment increase the dynamic in the industry, competition and task environments (micro environment);
2. An increasing dynamic in the industry, competition and task environments brings new entrepreneurial opportunities for entrepreneurial organisations and form the potential for renewal;
3. An increasing dynamic in the industry, competition and task environments brings new threats and increases competition and cost pressure (necessity for optimisation) for existing businesses;

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4. Entrepreneurial organisations use new opportunities with time delays and change the micro environment by the process of creative destruction: New products squeeze out old products, new industries squeeze out old industries⁴⁵⁴;
5. Entrepreneurial organisations counter threats in existing businesses via optimisation with time delays and achieve a short-term competitive advantage in the micro environment⁴⁵⁵;
6. Entrepreneurial decentralised units realise activities for optimisation;
7. Entrepreneurial decentralised units realise entrepreneurial activities for renewal;
8. If opportunities are realised, the competition dynamic in the industry (with maturity) increases (profits attract potential competitors/limits of growth);
9. If entrepreneurial activities for renewal are realised, (long-term) viability is strengthened;
10. If entrepreneurial activities for optimisation are realised, (short-term) viability is strengthened;
11. An entrepreneurial orientation of top management strengthens (via direct management processes) entrepreneurial activities for optimisation;
12. An entrepreneurial orientation of top management strengthens (via direct management processes) entrepreneurial activities for renewal;
13. An entrepreneurial orientation of top management strengthens (via structural management) entrepreneurial momentum;
14. If the entrepreneurial momentum increases, entrepreneurial orientation of top management is also strengthened;
15. If entrepreneurial momentum increases, the entrepreneurial activities of the decentralised units are strengthened;
16. Entrepreneurial activities in decentralised units strengthen entrepreneurial momentum.

In the following chapter, it is possible to derive from these connections a qualitative model for specification of the fundamental activity relationships.

⁴⁵⁴ According to Senge (2003:118-142) entrepreneurial activities for renewal in dynamic environments can be described as a *fundamental solution* to secure the viability of the organisation.

⁴⁵⁵ According to Senge (2003:131-142), entrepreneurial activities in existing businesses in dynamic environments can be stereotyped as *problem postponement* and serve to gain time for the realisation of the basic innovation solutions.

5.3.2.2 Model of a viable entrepreneurial organisation

The system structure developed in the previous section is described and illustrated in this section using a graph for specification of the interaction and networking of the entrepreneurial organisation with the business environment (see figure 114). Viewing the entrepreneurial organisation as an open system (Duncan 1975, Schein 1980), the entrepreneurial focus is on the exchange of inputs and outputs (products, services, information) between the organisation and its macro and micro environment as well as on the internal adaptation of the organisational goals and architecture to support this exchange (Thompson and McEwen 1958, Schreyögg 1995, Thompson 2003, Aldrich 2008). The dynamics of the business environment influences especially the technological basis of production and the market situation (Burns and Stalker 2001) for new and established businesses.

The situation in the business environment determines the structure of the entrepreneurial organisation (Chandler 1962, Mintzberg 1993) to create entrepreneurial activities and to achieve a strategic *fit* between different parts of the organisation⁴⁵⁶ (Dess and Lumpkin 2003) as well as between the organisation and its environment (Kieser and Kubicek 1983). The entrepreneurial organisation acts to develop new competencies and resources to foster entrepreneurial activities induced through the top management as well as through decentral autonomous entrepreneurial behaviour (Hitt et al 2005, Czernich and Zander 2009). Karimi et al (2010) classify the prerequisites of entrepreneurial behaviour in the three categories organisational factors, behavioral factors, and environmental factors. Thus, the entrepreneurial behaviour of the organisation can be stimulated through a changing external business environment (Johnson and Scholes 1993) as well as through an internal dynamic (Schumpeter 1950 and 2006, Bossel 2004) based on organisational levers like entrepreneurial strategy, structure, culture, resources and competencies. The entrepreneurial organisation as a whole living organisation learns about and adapts to the changing environment, builds sustainable and constructive relationships within the organisation and with entities in the external business environment (De Geus 2002).

⁴⁵⁶ Evolutionary economics is also concerned with the relationship between the individual and the organisation and also between the organisation and the environment - see inter alia, Beschorner and Priem (2000).

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From the systems, strategy and contingency literature, it is possible to deduce relevant variables for the qualitative model⁴⁵⁷ of the vital entrepreneurial organisation and its business environment as a dynamic landscape for opportunities and risks. The entrepreneurial organisation has to manage the exchange between the organisation and the external environment in established and new businesses⁴⁵⁸ to stay vital, as well as to create an entrepreneurial posture as a momentum of its own. The general macro environment contains the global and local political/regulatory, economic, social and technological/ecological dimension. The industry and task environment contains the relevant variables of the micro environment such as industry and competitive dynamics, as well as the buy-side and the sell-side of the entrepreneurial organisation.

This helps to identify the indirect and direct influences of the external environment on the organisation (Palmer and Hartley 2002). The general macro environment influences the industry and the competitive environment directly and the organisations operating in this industry more indirectly. The relevant micro environment with industry, competitive and task environment interact with the entrepreneurial organisation more directly (Osborn et al 1980). Changes in the micro environment have an influence firstly on the entrepreneurial opportunities and threats in existing businesses. Here, optimisation within existing businesses and thus efficiency improvements are at the forefront. Entrepreneurial organisations react to increasing competitive pressure by the use of new technology for process innovations. In time, these bring about an improvement in cost efficiency and thus improved competitiveness in existing markets and with existing products.

⁴⁵⁷ There is no direct link between the two complementary methods used in the research process sensitivity analysis (chapter 5.3.1) and qualitative analysis (chapter 5.3.2). The variables identified in the total system (chapter 5.3.1) serve as an input to the theoretical exploration in the aggregation process to deduce the qualitative model in chapter 5.3.2. Both analyses give complementary insights (sensitivity analysis on the role of the variables in the total system, qualitative analysis on the networking of the total system on an aggregated level to derive the basic interaction between the entrepreneurial organisation and the global business environment).

⁴⁵⁸ For a brief characterisation of new entrepreneurial ventures compared to small established businesses, see Nieman (2006). According to Malik (2006:246-256), management of new businesses is not significantly different from management of existing ones. New businesses must be uncompromisingly defined in terms of their market and a greater focus must be placed on the realisation of ideas. Large companies would then have the possibility to conduct permanent innovations systematically taking into account certain fundamental requirements for success. As examples, he names market leadership, room for new creations, separation of old from new, seeking opportunity from problems, positive evaluation of deviations from plan, experimentation.

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Therefore, an important contribution is made to the (short-term) viability of the organisation. For the long-term viability⁴⁵⁹ of the organisation, it is necessary to identify the current situation and the upcoming changes and trends in the business environment and to develop existing or new markets with new products as quickly as possible. Competitors that follow in turn increase the competitive pressure such that in industries that are just establishing themselves, entrepreneurial activities for optimisation become more and more necessary⁴⁶⁰. To secure the long-term viability of the organisation⁴⁶¹ in a dynamic environment, entrepreneurial organisations should continuously generate new and marketable products and develop new markets. New opportunities in international markets result from globalisation, although competitive pressure exhibits an increasingly global dimension. The top management and decentralized, autonomous entrepreneurial units (Axelrod and Cohen 2000)⁴⁶² induce entrepreneurial activities (Heinonen 2007). These activities are coordinated and stimulated through the organisational design and the corresponding internal dynamics (Hayek 1986:57-79, Probst 1987, Stacey 2011). These internal entrepreneurial dynamics⁴⁶³ depend on:

- The entrepreneurial strategy in established and new businesses and the evolution of the organisations mission over time;
- The entrepreneurial architecture⁴⁶⁴ with the formal and informal structures as well as the incentive and learning structures;

⁴⁵⁹ Bollmann (2001:17) requires a strong focus on long-term viability in complex environments.

⁴⁶⁰ Burke et al (2010) thus require a combination of competition strategies in existing markets (to slow down the fall in profits) using existing means for the conquest of new markets.

⁴⁶¹ Simon (1996:19) describes the securing of long-term company existence as the most important company objective. He studies unknown world market leaders and ascertains that market leadership is attained if many activities are made just a little bit better, a global marketing of products with higher quality for narrow markets results, greater innovativeness ensues and management teams with greater continuity and long-term objectives are in evidence. Simon (2007) then ascertains that proximity to customers is a central element of the successful *hidden champions* under examination and who increasingly offer systems solutions. Driving forces for innovation are the market and technology together with decentral structures where high performers are free to behave entrepreneurially. In addition to this there are ambitious company objectives, a high degree of vertical integration where the customer is used as an important source of ideas. With national locations there is a motivational mutual dependence between the company and the employees.

⁴⁶² According to Vannotti (1992:40) intrapreneurs must on the one hand be disciplined and follow a vision, but they must also be independent and successfully interpret the vision.

⁴⁶³ According to Vermeulen (2010) the internal momentum can in particular be strengthened by a personal dynamic.

⁴⁶⁴ For Vanotti (1992:39-40) the design of the organisation shape is of great significance. However, the actors and the commonly held vision are key for effective intrapreneurship. Entrepreneurial actors carry, then, a restricted responsibility for decisions, are part of the whole, bear restricted personal risk in terms of their own careers and identify with the organisational unit they are responsible for.

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- The entrepreneurial culture⁴⁶⁵ with a focus on information, communication, cooperation, innovation, learning, identification and motivation⁴⁶⁶;
- The entrepreneurial exploitation of resources and competencies⁴⁶⁷.

The qualitative model (see figure 114) links the entrepreneurial organisation with its environment and presents the exchange through entrepreneurial activities in new and established businesses on a highly aggregated level.

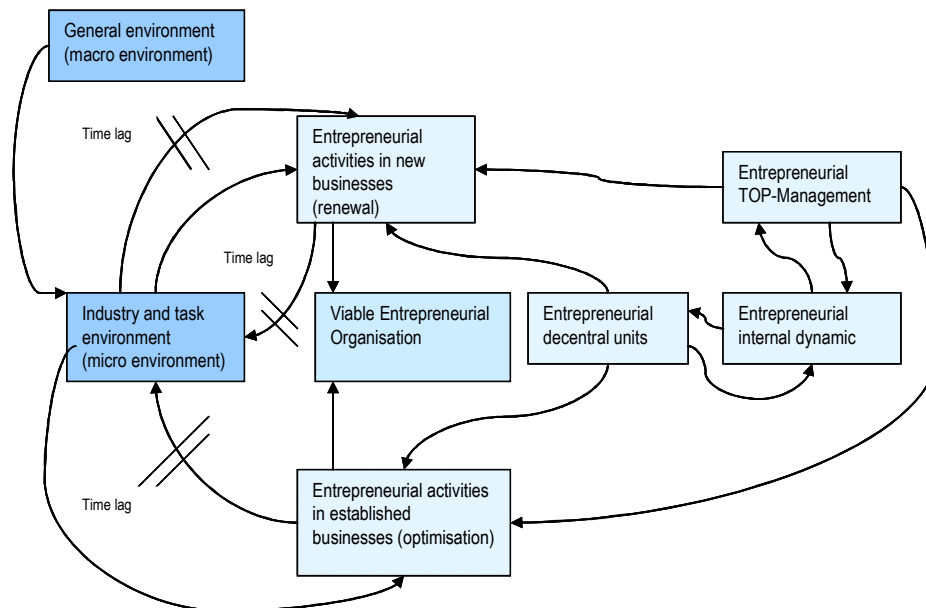


Figure 114: The viable entrepreneurial organisation and the business environment⁴⁶⁸

⁴⁶⁵ According to Rathe and Witt (2000:160-165), common mental models and collectively shared interpretation templates arise from the individual and collective learning processes. For the growth process in an organisation, the ability to generate and use knowledge is decisive.

⁴⁶⁶ Vannotti (1992) sees a commonly held vision and mutual trust as the basis with which entrepreneurial actors as agents of change responsibly shape product innovations and changes and thereby extend their competencies. For this, they need, in particular, freedom of action within laid-down guidelines, flat hierarchies and direct reporting, decentralisation of responsibility and decision-making, the controller as co-pilot, error tolerance, open access to information and recognition of and willingness to take risks in the company.

⁴⁶⁷ For the influence of top management on intrapreneurship, see also Schmelter (2009). Mintzberg (2009) states that in most cases, employees only need have a minimum of management and that the development of a feeling of togetherness should be at the forefront of management tasks.

⁴⁶⁸ The model considers in a complementary way both variants for steering the entrepreneurial organisation through entrepreneurial activities: The realisation of decisions and measures by instruction (in less complex environments) as well as by systemic evolutionary self-regulation within the context of moulded advantageous and guiding conditions (effective momentum in complex environments). For a comparison of both basic paradigms of *construction* and *evolution* - see Malik (2004:101-150). The time lags via theoretical exploration introduced in the model reflect patterns in the real world, where there is no perfect information and information gathering and reactions need time. Systems thinking helps the entrepreneurial organisation to be aware of such existing structures and archetypes (Senge 2006:92-112): In established business, the competitive and industry environment gives constant pressure for (lagging) adaptation (archetype shifting the burden); new businesses (lagging innovation) can be interpreted as the fundamental solution, but the schumpeterian gains of innovation attract new competitors (archetypical limits to growth) and brings (lagging) need for adaptation (the business evolves to an established business).

5.4 Conclusion: Building blocks for the vital entrepreneurial learning organisation

Firstly, today's business environment demands intrapreneurship and innovation from companies, embedded in a holistic management approach. Secondly, successful intrapreneurship requires a strong focus on the external and internal business environment to find and work on entrepreneurial opportunities and risks to build new competitive advantages, as well as to adapt the firm to a changing and turbulent world. Entrepreneurial firms have to achieve a dynamic *fit* between the firm's internal configuration (organisational architecture, culture, resources and capabilities including technology) and the strategic exchange with their external business environment (in both directions). Therefore, entrepreneurial organisations can use and develop internal entrepreneurial systems dynamics to support emerging entrepreneurial activities as well as an explicit initiating of entrepreneurial activities through the top management and through decentralized unities and venture teams (see Beugelsdijk 2007).

Holistic intrapreneurship means to act on three basic entrepreneurial tasks:

- (1) Entrepreneurial collection of information: Identifying opportunities and risks;
- (2) Entrepreneurial creation of the future: Entrepreneurial decisions for efficiency, adaptation and innovation;
- (3) Building the organisational architecture of the entrepreneurial organisation.

There is no one best way to design an entrepreneurial organisation, so every organisation has to build their own organisation's design using cultural diversity in global market places. Entrepreneurial organisations adapt this organisational architecture and the strategies for interacting with the external business environment permanently to respond and act on the continuous change in the macro and micro environment. The conceptual role model of the entrepreneurial firm introduced here as a first building block is a general framework to address the entrepreneurial roles that a firm has to fulfil in a specific way to perform an entrepreneurial orientation.

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This unique forming (entrepreneurial shaping of the organisation) depends heavily on the cultural context and the specific environment in which it operates (see Scheepers, Hough and Bloom 2007). The conceptual model defines five entrepreneurial roles:

- (1) Knowledge manager - scanning, monitoring, forecasting and assessment: understand the (future) global business environment and the means for the organisation;
- (2) Idea manager - thinking up new things: identify new opportunities and risks in the global business environment
- (3) Innovation manager - doing new things: put new opportunities into practice and manage risks;
- (4) Entrepreneurial manager – carrying out established business with an entrepreneurial posture: managing optimisation, risks, flexibility and adaptation;
- (5) Synergy manager – holistic management of resources and activities: organisational design for job-sharing, specializing and learning, coordination and motivation with harmonized organisational and individualistic objectives, as well as taking advantage of (cultural) diversity.

To get a holistic picture of the environment and for an entrepreneurial collection of meaningful information, it is useful to focus on the second building block developed – the framework of the global business environment with four dimensions:

- (1) Geographic dimension of the business environment: how global are the current and future operations and industries? Where are the current and future markets and playing fields?
- (2) Fields of influence and interaction between the organisation and its business environment: how can one describe and understand the business environment? What is the operational (micro) and what is the relevant general (macro) environment?
- (3) Uncertainty in the business environment: how dynamic and complex is the environment? What entrepreneurial intensity is sufficient?
- (4) Cultural dimension of the business environment: how can the entrepreneurial organisation use the diversity? What adaptations are required?

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The Model of a viable entrepreneurial organisation describes, as a third building block, the exchange between the entrepreneurial organisation and its external environment (entrepreneurial creation of the future) in both directions. Entrepreneurial activities in established businesses help to improve the short-term viability of the entrepreneurial organisation. The long-term viability depends on a continuous stream of new businesses, especially in a globally competitive technological business environment. The model includes structural elements to support positive entrepreneurial dynamics. Thus, the three entrepreneurial tasks, linked to the three theoretical constructs of the role model, the framework for the business environment and the qualitative model of the viable entrepreneurial organisation can together be used to describe together the role of intrapreneurship in a global business environment. The role model and the three basic entrepreneurial tasks can be used as a guideline to evaluate and assess the basic actions to achieve an entrepreneurial posture in technology firms in a holistic way. It is also a starting point for building a specific firm model in a unique cultural context. This model may also be extended to include cross cultural effects. Using the framework developed for understanding the global business environment and the model of the viable entrepreneurial organisation in its environment, the entrepreneurial organisation can identify the specific lever for long-term vitality.

In chapter 6, the theoretical findings are examined in detail by an empirical study taking a look at the practice of globally active technology companies (see figure 115). Firstly, there is a cross-company written survey of managers and employees on the role of intrapreneurship (study 1 in chapter 6.1) and a written survey of managers and employees in a highly innovative company as a reference group (study 2 in chapter 6.2). Subsequently, experts are questioned about the implementation of the role model in a specific organisational context and the information gathered is evaluated qualitatively with a cross-company focus (study 3 in chapter 6.3). The findings from the studies are used to complement, by way of a digression (see chapter 6.4), the design concept for holistic intrapreneurship (see chapter 5) using an outline for the development and strengthening of a vital entrepreneurial learning organisation.

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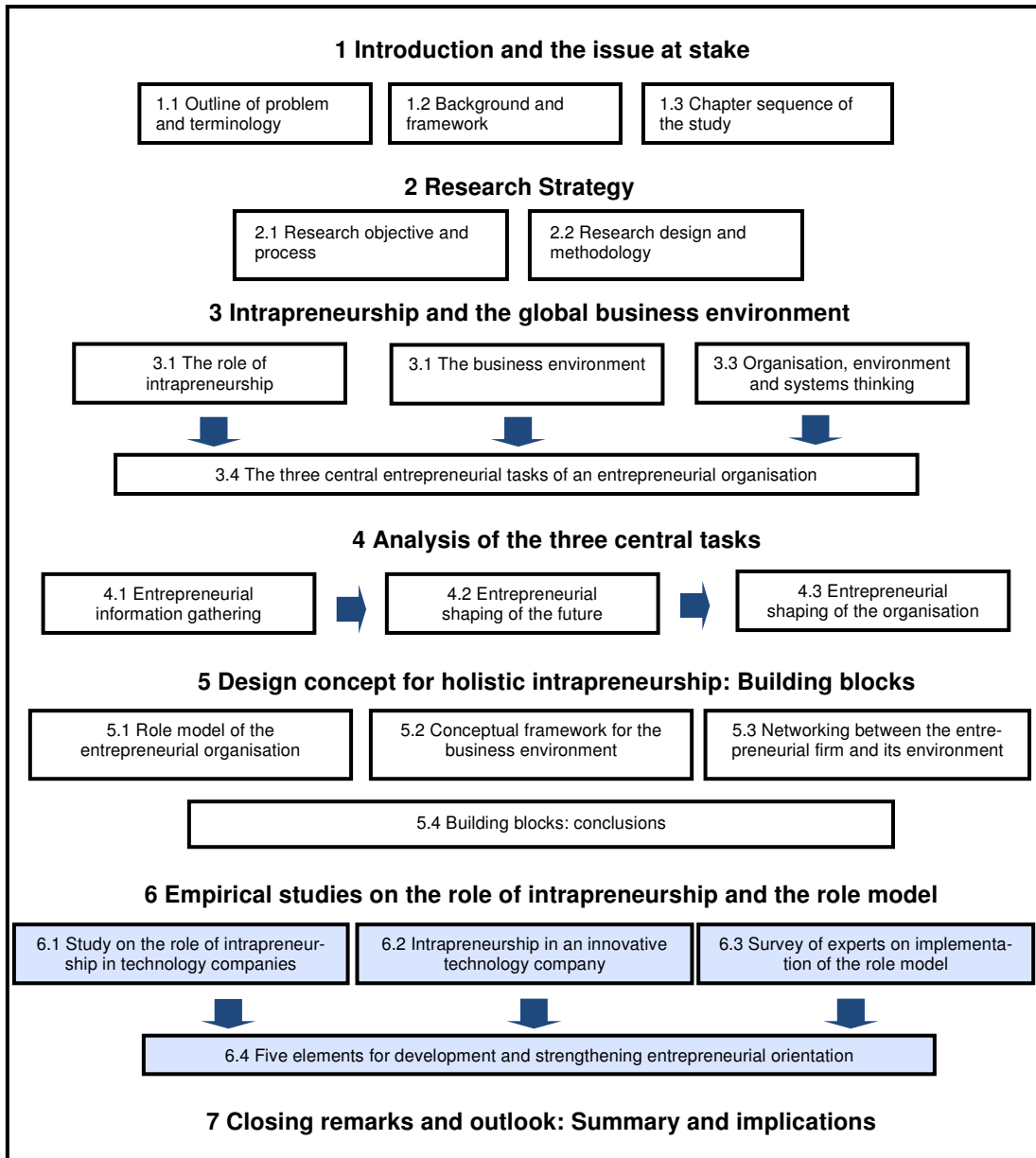


Figure 115: Empirical exploration on the role of intrapreneurship and the role model