

**KNOWLEDGE INTENSIVE
ENTREPRENEURSHIP IN NETWORKS:
TOWARDS A MULTI-LEVEL/MULTI
DIMENSIONAL APPROACH**

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INTRODUCTION

The process of invention, innovation and diffusion of new technologies is a process that unfolds within established economic structures, but at the same time changes them: a phenomenon known as structural readjustment (Schumpeter, 1934). The development and introduction of new technologies offers opportunities for knowledge intensive entrepreneurship. Entrepreneurship is defined as a context dependent process, through which individuals and teams create wealth by bringing together unique packages of resources to exploit market place opportunities (Lyon *et al*, 2000, Ireland *et al*, 2001, Brush *et. al*, 2001). However, actors and systems in the established structure of society often resist such changes and constitute barriers for knowledge intensive entrepreneurship. It is this tension between opportunity and resistance to change, which inspires the research described here. Describing, experimenting with, and explaining differences in patterns of knowledge intensive entrepreneurship are the core research methods and goals.

However, in entrepreneurship theory there is no coherent framework (*ibid.*, Van der Veen and Wakkee, 2004), which would enable multi-dimensional and multi-level analysis of entrepreneurial processes in such multi level action systems. In this article a multi level/multi dimensional framework based on a revision of classical social system theory (a.o. Parsons, 1937, 1964 (1951), 1977) which will fill this void, will be described

and illustrated. The central issue in this paper is *What contribution can social system theory offer for the systematic description, explanation and design (of support) of knowledge intensive entrepreneurial processes.*

The first part of the paper titled 'research on knowledge intensive entrepreneurship' outlines the object of research and discusses very shortly problems of approaches found in literature. It is not a complete literature review as that would fall outside the scope of this paper. It is contended that to understand the nature of these entrepreneurial processes many of current approaches are too much focussed on a few aspects or are using too broadly defined concepts, lacking a coherent framework in which partial research outcomes can be integrated and understood. The second part of the paper focuses on describing a systematic dynamic framework for entrepreneurship research. It is based upon a coherent set of assumptions about the actors under study and defines four dimensions of action patterns. In the third part of the paper propositions are described. Examples of current research results are added to illustrate applicability of these propositional. In the last part the paper concludes with the description of a research framework for entrepreneurship research, which is suggested as an answer to the central question .

RESEARCH ON KNOWLEDGE INTENSIVE ENTREPRENEURIAL NETWORKS

Defining Knowledge Intensive Entrepreneurship

In an ongoing research activity the aim is to establish the state of the art on entrepreneurial processes. Van der Veen and Wakkee (2004) presented an analysis of the current status of entrepreneurship research based on (mainly U.S. based) literature. This analysis mentions and discusses many definitions of entrepreneurship that are currently in use, and discusses many aspects of entrepreneurial processes that receive attention from the field. For this paper it is important to note that *entrepreneurial processes can be defined as processes, in which an entrepreneur sees (a) business opportunity (ies), develops it to a business concept and brings it into exploitation.* When these processes are to a great extent based on relatively new (mostly academically derived) knowledge or technology, we speak of knowledge intensive entrepreneurial processes.

To go somewhat deeper into this knowledge intensive character I refer to technological changes in, for example, information and communication

technology, biotechnology or nano-technology, which induce important strategic changes in industry. The strategic involve changes are in the areas of products, changing actors on markets, (clients, competitors, suppliers), and changing market structures that alter the rules of the game, both on local as well as global levels. These changes imply large network dynamics. In turn, this results in questions for entrepreneurs regarding how to handle network interactions on individual, organisational and network level. As complex networks of socio-economic institutions are shaped and shape the development of new technologies (a.o. Chandler, 1990, Christensen, 1997, Garud, 1994, Rip and Groen, 2001) knowledge intensive entrepreneurs are especially affected, as they must deal with and act in these dynamic networks. Many (small) firms beyond their individual scope cooperate with other organisations, large and small, to exploit new technologies in networks. This is labelled as “entrepreneurial networking” (see also During and Klein Woolthuis, 1997). Uncertainty of the outcomes and the iterative nature of the learning processes are features in organising and operating the network. Another specific characteristic of entrepreneurial networking is that entrepreneurs will, themselves, operate as actors in the network and will often be involved in the execution of project activities (During and Oakey, 1998). Furthermore, knowledge institutes play an important role as a source of technological developments. The growing multi-disciplinarity of technological innovation, on the one hand, and necessity to specialize due to fast technological development, on the other, imply that knowledge-based entrepreneurial activities are more often carried out in heterogeneous networks of large and small firms, universities and other knowledge institutes (a.o. Groen *et al*, 2002, Rip and Groen, 2001, Huff, 2000). It is important to note that knowledge institutes not only include universities or other (semi-) public institutes, but also many private / commercial R&D organisations must be considered as belonging to the network of knowledge institutes. Therefore, they are influencing entrepreneurial processes in- and outside their own firms.

Entrepreneurial Networking

The relevance of external communication and the establishment of links with outside organisations have been widely noted for small firms in general, and technology based firms in particular (a.o. Dubini and Aldrich, 1991, in: Ireland *et al*, 2001, Larson, 1991, 1992, Groen, 1994, Groen and Nooteboom, 1998, Klein Woolthuis, 1999, Klein Woolthuis *et al*, 2001). The growing interest in co-operative actions of entrepreneurs is in line with re-

cent trends in the research on entrepreneurship and small business management in Europe. Co-operation comes out as one of the four most researched themes in a review of research on entrepreneurship and small business management (Landström *et.al*, 1997).

Networks are often defined as patterned relationships between actors such as individuals, groups or organizations (Aldrich and Zimmer, 1986, Burt, 1982, 1992, Gulati, 1998, Ireland *et al*, 2001). Networks may take many forms including strategic alliances, joint ventures, licensing arrangements, subcontracting, joint R & D and joint marketing activities (Dickson and Weaver, 1997, Weaver *et al*, 1998). An organizational network is a voluntary arrangement between two or more firms that involves durable exchange, sharing or co-development of new products and technologies. Strategic direction, financial capital, technology, knowledge and network connections may be committed to a business network. Others define networks as a set of interdependent actors, activities and resources (Håkansson, 1982, 1989, Håkansson and Snehota, 1995). In the seventies these last authors started from a dyadic analysis of supplier-customer relations in international business marketing. From there, they developed a network model, in which not only bonds between actors, but also links between activities in chains and resource ties together comprise a business network. This conceptualization of networks points out, in line with so called structural network theory (e.g. Burt, 1982) that multiple aggregation levels exist within networks. In the approach described here the micro-level refers to entrepreneurs interacting with other individual or organizational actors. The meso-level refers to actors who have the same role for many micro-level actors because of their equivalent position in the network of those micro-level actors. An example is the trade organization, of which many entrepreneurs are a member, and the influence on each of those entrepreneurs is comparable. Another example is the university influencing individual researchers on an equivalent way through institutionalized processes of the commercialization of knowledge.

Increasingly, these networks may extend over country borders. For example, Wakkee c.s. (2001) discuss the concept of global start-ups who are typically involved in cross-border co-operation from an early stage in their development.

Towards A More Systematic Descriptions and Explanations for Differences in Entrepreneurial Processes

From the above, it can be concluded that the role of networks has been studied quite extensively, although it is also clear that this body of literature is fragmented in a number of ways. First, networks are conceptualized on many different ways. Relations with other aspects are often taken only in an ad-hoc way into consideration. Furthermore, methodologies in use differ strongly, ranging from purely quantitative (e.g. Burt) to purely descriptive case studies (e.g. Hakansson c.s.). Significant gaps still exist, specifically on the role of entrepreneurs in innovation networks, and research is necessary to fill these gaps.

The framework developed in this paper is aiming at explaining differences in entrepreneurial processes. As stated in the opening paragraph, entrepreneurship is often seen as one of the core processes in rejuvenating society, through exploiting opportunities that are based on new technology. However, in many cases entrepreneurs fail (50% of starters are not surviving the first five years), and knowledge intensive entrepreneurial activity within existing firms (R&D based NPD or business development) is often not successful. There are many factors mentioned in literature that provide partial explanations for the differences of success. Researchers are looking for a systematic theoretical view that could accommodate the analysis of multi-level networks of entrepreneurs, organisations and macro-environment aspects focusing on micro interaction patterns in networks leading to the changes in structures on micro-, meso- and macro-levels. Furthermore, recognizing the multi-dimensionality of actions of an entrepreneur could prevent researchers from defining concepts too broadly. As Simon (1976) and Etzioni (1988) already showed quite convincingly with the example of X-efficiency; there is little information in broadly defined concepts.

Furthermore, both qualitative and quantitative process oriented research methods are important to find levers for intervening in empirical processes. A static and/or uni-dimensional approach might be useful in theory development or strict testing of hypothesis type research; for research in a living system a dynamic multi-dimensional process approach might be a more useful capstone for research.

FRAMEWORK DEVELOPMENT

The development of a multidimensional framework that would fit the

goals of entrepreneurship research is inspired by the work of Parsons (a.o. 1951, 1977, Groen, 1994, Groen, c.s., 2002). The starting point of the assumption set is that entrepreneurs act purposefully in interaction with other actors (see also Granovetter, 1985, 1992). A social system was originally defined as:

"...a social system consists in a plurality of individual actors interacting with each other in a situation, which has at least a physical or environmental aspect, actors who are motivated in terms of a tendency to the " optimization of gratification" and whose relation to their situations, including each other, is defined and mediated in terms of culturally structured and shared symbols"

(Parsons 1964,pp.5-6)

Four mechanisms are embedded in this definition:

1. interaction between actors,
2. striving for goal attainment,
3. optimisation of processes, and
4. maintaining patterns of culturally structured and shared symbols.

Each of these mechanisms produces its own type of processes, within those processes its own type of capital, and for each of those processes specific methods of intervention. For example, trying to use money to change strategic goals could often be understood as not an appropriate use of means of intervention; in this case it might be seen as corruption. Forcing others to buy against a high price based on monopoly power is another example of a wrong use of a mean of one setting (strategic or goal attainment domain) in another (economical domain). It is normally seen as not appropriate in an economic context. Appropriate, on the other hand, is using means belonging to a dimension in this dimension to the end of accomplishing a functional act. The mechanisms of action for each of the dimensions are described in Table 1. A capital is labelled and the mostly important resources leading to such capital are mentioned. Last, but not least, some intervention methods, which fit within this dimension of action, are mentioned.

Table 1. Four Dimensions of Entrepreneurial Networking.

<i>Dimension</i>	<i>Relates to</i>	<i>Capital</i>	<i>Resources</i>	<i>Some interventions</i>
Scope	Strategic goals	Strategic capital	Power, authority, influence, strategic intent	Using power Redefining strategy
Scale	Economic optimization	Economic capital	Money	Using financial incentives Cost cutting
Skill & Value	Institutions and pattern maintenance	Cultural / human capital	Values, organization, knowledge, skills, experience, technology	Training & education Teambuilding Organisational systems New technology
Social network	Interaction pattern / process	Social capital	Contacts (multiplex, filling structural holes, cohesive, equivalent)	Relation management Changing network structure Using brokers Supply chain mgmt

All four mechanisms work concurrently and influence the outcomes of a social system in a structured, though not deterministic, way. Entrepreneurs develop positions using resources in interaction with others. In interaction, entrepreneurs use these capitals more or less successfully, which leads to recursive relations between capital use in one situation and possibilities later in time.

The central hypothesis is that on each of those four dimensions entrepreneurs, within network embedded enterprises, will need sufficient capital in each of the dimensions to create sustainable enterprises. An auxiliary theory can be found or developed for each of the dimensions to operationalize the concepts further and use scientific sources often developed in mono-disciplinary approaches. Adding value to these mono-disciplinary approaches by assessing the relevance of each of the dimensions in relevant contexts, compared to other dimensions.

Scope: Goal Attainment Orientation

Goal orientation is reflected in entrepreneurial strategies aiming at creating certain possibilities and exploiting them successfully. The entrepreneurial orientation of the entrepreneur determines the ambition level and scope of entrepreneurial action. With this concept, differences in ambitions and action-orientation of entrepreneurs are acknowledged, taking into account autonomy, innovativeness, risk taking, pro-activeness and competitive aggressiveness (a.o. Covin and Slevin, 1991, p.10, Lumpkin and Dess, 1996).

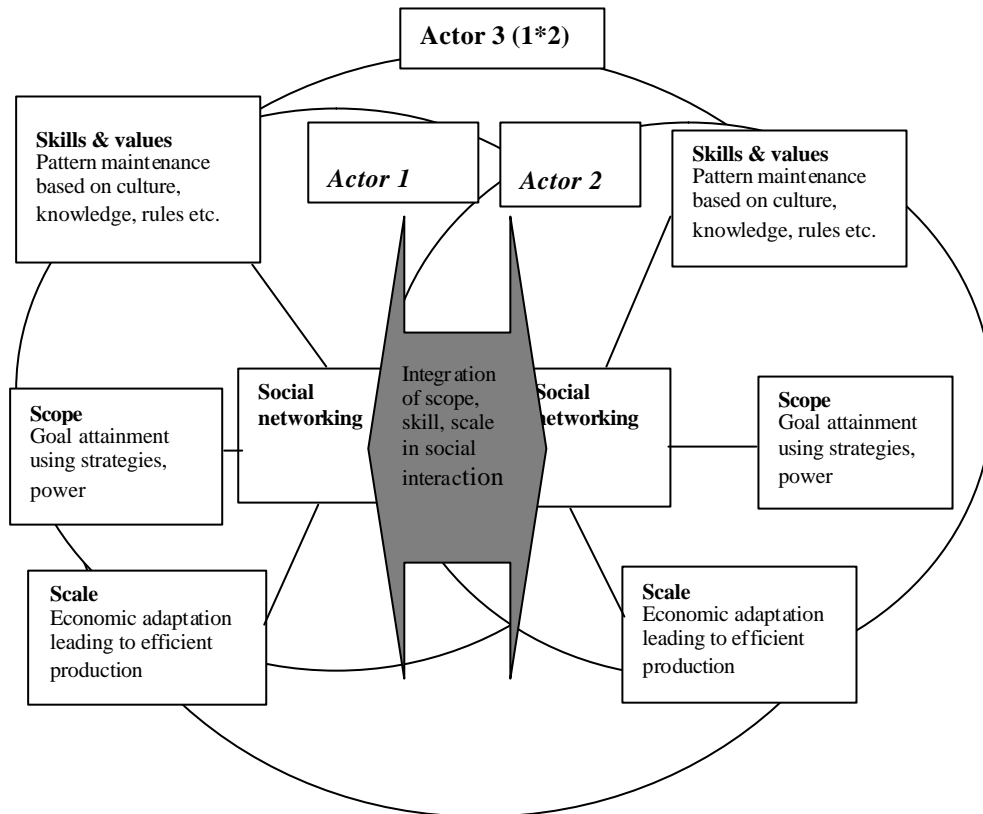
Scale: Economic Optimization

The tendency to *optimize* gratification refers to the economic concept of efficiency. This is related to economic capital (financial resources) and, therefore, in many cases depends on the size of the firm (a.o. Amit and Shoemaker, 1993). Efficient exchange of goods and services is the central process in this economic dimension. The general medium of exchange in the dimension (economic capital) is money.

Skills: Cultural Reproduction/Pattern Maintenance

Furthermore, interaction in socially structured networks is mediated in a culturally structured and (at least partly) shared system of symbols (cf. Parsons, 1951, Groen, 1994, Rip and Groen, 2001). This is also important for understanding differences in human skills of entrepreneurial actors. The system of shared symbols enables pattern maintenance and change. Based on the homogeneity of a shared culture, language, and knowledge -- in short cultural capital (Bourdieu, 1973) -- entrepreneurs can communicate with other actors in their network. However, based on the heterogeneity of knowledge, the attitudes and behavior of an entrepreneur can generate new resources to perform business with (Granovetter, 1973, Burt, 1992, Gulati c.s. 1999, 2000). Such entrepreneurial capabilities are a combination of proprietary resources, knowledge and skills held by entrepreneurs, their companies and actor combinations in their network. These skills are institutionalized in operating routines and tacit knowledge (Groen and Nooteboom, 1998, Brush, Greene and Hart, 2001.), or, as Shane labels this, in prior knowledge (Shane, 2000). On a higher aggregation level one could distinguish socio-technical regimes and landscapes in which the entrepreneur has to find or create his way with new technology (a.o. Rip and Groen, 2001).

Figure 1. Two-actor Network Model of Actors in a Social System Perspective.



Social Networks: Integration

All the described processes take place in networks of interaction. Analyzing entrepreneurship from a network perspective, therefore, offers possibilities to understand dynamical processes, which entrepreneurial processes are by definition. Brush, Greene and Hart (2001) described recently the role of social capital produced in networks for the entrepreneurial challenge—described as identifying, attracting and combining various resources, and transforming of personal resources to organizational resources (ibid. p. 77).

To meet his challenge the entrepreneur has to develop a network, which results in connections to resource providers (clients, partners, consultants, governments etc.). Brush et al. categorizes resources as: human, social, financial, physical, technological, and organizational and these can

range from simple tangible (money) to complex intangible (knowledge). Comparing this to the four dimensions mentioned above, the list can be complemented with resources such as power and the resources systematized by attributing them to a dimension.

Multi-Level and Multi-Actor

Our model is depicted in figure 1, based on these four dimensions, indicating that a multi-dimensional (multiplex) exchange takes place in building up a business relation. This happens not only on an organizational or individual level, but on multiple levels concurrently. Therefore, a full analysis of interaction in networks would require a multi-level and multi-dimensional analysis of interaction processes. As this is not always feasible, this kind of multi-level/multi-dimensional analysis is not attempted in all research projects using this approach. The framework can be seen as an analytical framework in some circumstances, but it also serves as a capstone, for which more specific research is building the support structure.

TOWARDS A FOUR-DIMENSIONAL MULTI LEVEL FRAMEWORK OF ENTREPRENEURIAL PROCESSES

Combining the described action theory framework with the definition of entrepreneurship, a process of recognition, development and bringing into exploitation of an opportunity, brings us to the main structure of a framework for analyzing dynamically entrepreneurial action systems. On the one axis four dimensions of embedded action are defined, and on the other axis three phases of entrepreneurial processes are depicted. It is contended here that based on the embeddedness notion of actors in networks this framework can be applied on multiple levels of aggregation levels of the networks in question. Furthermore, by taking into consideration what kind of interactions take place in the processes of entrepreneurial networks explicit connections can be made between multiple levels of action, and the four dimensions of action.

As mentioned above individual projects within this approach can be focused on parts of the framework. The framework opens up 12 partial research questions looking at direct effects of one dimension in one part of the entrepreneurial process. For example: What is the relation between differences in social capital of an entrepreneur and differences in opportunity recognition? However, at the same time the framework determines what

has to be held constant to be able to assess this partial relation. More complicated approaches would allow for analyzing not only direct effects in one or more of the four dimensions, but it is also possible to analyze interaction effects of multiple dimensions in entrepreneurial processes. Elsewhere a systematic treatment of the interaction effects will be given.

In Table 2 examples of ongoing projects are mentioned. In the next paragraph a few of these examples will be described as illustrations of the use of this framework.

Illustrations of Current Research

The general research question of this paper is starting point for the illustrations:

What contribution can social system theory offer for systematic describing, explaining and design (of support) of knowledge intensive entrepreneurial processes.

From this main question three questions are chosen to discuss.

Question 1: To what extent are differences in outcomes of entrepreneurial processes explained by differences in four social system capitals of entrepreneurs?

The first question is most general and relates to the general explanation of differences in performance of enterprises. One way of dealing with this question is looking at the direct effects over time of the four capitals in each of the theoretical dimensions. This leads to the following hypothesis:

H1: Entrepreneurs with more of the four capitals (strategic, cultural, economical, social) in time frame 1 (t1) perform generally better in time frame 2 (t2), then entrepreneurs with less capital (at t1)

Although this seems to be obvious, it adds to our understanding that not one of these capitals is determining, but that each of the capitals (and the related processes where these capitals are used) contribute to performance. It points out that optimizing one capital, in practice often economic capital, will lead to sub optimal outcomes over time. Hamel and Prahalad (1992) labeled attempts of constant cost cutting in the business process

redesign management fad as “anorexia management”. In H2 this mechanism is put forward more distinct:

- H2: Entrepreneurs having one or more of the four capitals below a threshold value capital will generally not survive.

Measuring performance assumes an auxiliary theory for describing the content of the performance and placing it in a process context. For example, in a current project the value of research and development in a business development network is assessed (Groen c.s., 2002, Kerssens and Groen, to be published). In this project, it is shown that multiple values, such as knowledge creation (cultural capital), are primarily valued by the R&D actors themselves; strategic capital in the form of patents, which block developments at competitors, valued in certain strategic management positions; social capital generated in the network interacting in the R&D projects (e.g. university-industry networks) are for example much valued by commercial managers as it adds to their credibility towards customers.

Another type of project is aimed at following developments of start up companies. In Groen and Jenniskens (2003), a project is described, in which 60 persons are tutored in an incubator. From each of these 60 entrepreneurs, daily information is received on networking behavior and the contributions of that for their four types of capital. This furthers insights in entrepreneurial dynamics of nascent entrepreneurs, a context barely researched.

In relation to H2 it is a daunting task to determine threshold values of the four capitals. One way could be to design simulation models. Another approach is in execution in a project. This project aims at finding empirically based threshold values by longitudinal monitoring of all technostart ups in a large part of the Netherlands over a period of more than five years. Furthermore, looking back at the development of 200 firms who were part of a entrepreneurship support program at a university, we hope to develop a (multiple equation) model to estimate threshold values per dimension.

Question 2: To what extent are differences in strategy, scale, skill and social networking of partners in co-operation explanatory for differences in entrepreneurial networking?

This question relates to an aspect of entrepreneurship, which is according to this approach a main mechanism of entrepreneurial development: collaborative networking. It illustrates the possibility of focusing on one dimension, without discarding the other three. In principle every other dimension or for combination of dimensions could be central in a project. It is a matter of interest of the research of the author that we illustrate here focusing on the networking dimension. Some authors in the network theory field, especially Ronald S. Burt (a.o. 1982, 1992), contend that analyzing the differences in network would be sufficient to understand differences of performance. However, understanding the relational content within the relational patterns of the networks in Burt's work is based on ad-hoc reasoning. Network theory does not provide in systematic explanations of differences in contextual content. The approach followed here does provide an explanation in more systematic theoretical way, by using the three other dimensions of action.

As an example hypothesis three relates to the general structure of a relation, (complementarity) and the outcomes of entrepreneurial processes.

- H3: Entrepreneurs, who have more complementary capitals with regard to partners, generally will have a better chance to succeed in entrepreneurial networking

In a project looking into this hypothesis social system theory was used in combination with Ring and Van de Ven (1994) model of relationship building to evaluate cooperation in networks (Groen c.s. 2001).

Another project analyzes the connection of the entrepreneur and his technology (in a radical new technology setting) with existing and / or emerging technological regimes. Analyzing the entrepreneurs network connections with actors in these existing or emerging regimes seems promising for business opportunity assessment of new technology based firms. For example, analyzing specific networks in the micro-system technology field might enable some direction for starting entrepreneurs in this field.

Answering one of the flaws of the traditional use of social system theory in the structural functionalist approach in sociology (a.o. Parsons,

1977,), which was an over emphasis on consensus in relations, a related hypothesis (4) amplifies the effects of differences of cooperating actors.

- H4 The higher the awareness of entrepreneurs of the differences in 4S capitals compared to partners, the better chance to succeed in entrepreneurial networking

Question 3: How can the outcomes of entrepreneurial actions be influenced?

In our approach of entrepreneurship as a science practical implications of research are important. Therefore we systematically search for design rules for entrepreneurship related processes. Supporting entrepreneurship is important for economic development in regions. One hypothesis derived from the framework on support arrangements is again related to the dimensions of social system theory.

- H5 The more dimensions of actions are systematically influenced in (quasi-)experiments to improve entrepreneurship, the better results a stimulation program will have.

For example in analyzing incubation systems for global start ups Kirwan analyzes effective university based support systems. In an ongoing Ph D research project Morsink focuses on incubation of medium level technology/knowledge based firms and the role of coaches aiding to the cultural capital of entrepreneurs in the incubator. Separate and combined effect of supporting one or more dimensions is assessed in these projects.

CONCLUSIONS

This paper describes a theoretical framework for research, which looks at micro interaction patterns in networks of entrepreneurs and other actors leading to innovation, new business and, consequently, change in economic structure on micro- meso- and macro-levels is described.

Theories in use are entrepreneurship theory, network theory, social system theory and innovation theory. The approach is characterized by assuming a functional actor perspective and a process approach. It assumes embeddedness of actors.

Main conclusion is that combining social system theory for analysing entrepreneurship processes contributes to the development of a relevant scientific and practical framework for this research. Based on this theoretical scheme, the article addresses the issue of entrepreneurial processes in a broad, though limited way. Resources, which are important in many theories, are linked to specific dimensions of the actions of goal-oriented actors and, therefore, theoretical explanations of the differences in entrepreneurial outcomes are systematically derived at. In contrary to much of available entrepreneurship research the focus is not on the individual, organizational or regional level. In this approach no focus on one level of analysis or one dimension of action is set on forehand. This depends completely on the research question at hand.

Whereas limitations of singular research projects in this system theory are acknowledged, it is contended that this framework enables accumulation of knowledge over projects into the multi-level/multi-dimensional knowledge is generated by the systemic character of the research. In table 2 suggestions of examples of research questions which comprise a scientific program in this area are given. However, it must be noted that these suggestions are not exhaustive and other entrepreneurial process elements could be taken in. This selection is based on the author's interest in high tech entrepreneurship and reflects the empirical field of current research within the author's working environment. However, it shows the potential of organizing a complex and fragmented field (Watkins, 2003) as entrepreneurship, in this case limited to knowledge intensive entrepreneurship. For further research related to interaction between dimensions much has to be developed. However, also mono-dimensional analysis is interesting from an operationalization perspective. Also the logical connection with auxiliary theories needs more work. The potential for practical purposes is created by applying the framework to the design of more precise support and management instruments for new businesses.

Table 2. Empirical Research on K. I. Entrepreneurship in Networks.

	Recognizing opportunities	Developing business concept	Bringing into exploitation/growth
Strategic/goal attainment issues	<ul style="list-style-type: none"> - Entrepreneurial orientation and innovation 	<ul style="list-style-type: none"> - The role of entrepreneurial networks in building strategic capital for business development - Use of contracts in cooperation - Building new business in strategic alliances 	<ul style="list-style-type: none"> - Strategic flexibility through entrepreneurial R&D networks - Power balance in supplier networks of high tech start-ups
	- University policies for University industry interaction		
Cultural/pattern maintenance issues	<ul style="list-style-type: none"> - The entrepreneurial career of technical highly educated persons - The role of socio-technological patterns in radical innovation processes - Coaching mechanisms 		
	Network support for biotech start ups	<ul style="list-style-type: none"> - Co-operation between Dutch & Indonesian firms for medical NPD - Evaluating support arrangements for university spin off 	<ul style="list-style-type: none"> - Explaining differences of growth in SME based on organisational configurations - Use of intellectual property instruments
Economic/efficiency related issues	The role of subsidies in stimulating start ups	- Valuation of R&D in heterogeneous networks	The role of subsidies in stimulating cooperation for innovation
Social /network related issues	<ul style="list-style-type: none"> - Role of networks of entrepreneur in e-business adoption in SME 	<ul style="list-style-type: none"> - The role of networking in high tech global start up development - The effect of U.I.I. networks on business development 	The role of networking for value creation with R&D in a large steel company
	<ul style="list-style-type: none"> - Describing longitudinal developments of high tech start up development - The role of a strongly dispersed network of champions in stimulating entrepreneurship in a region 		
Integral 4 S projects	<ul style="list-style-type: none"> - Support of Global start ups - Development of regional support for business genesis - Value creation and justification in R&D networks - Many visible hands to modulate technology development by entrepreneurs 		

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