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**Innovation in Craft Enterprises -
Barriers and Success Factors**

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Abstract:

The craft enterprises as well as the whole economic structure of Germany are affected by considerable structural changes. In the past craft enterprises had mastered the challenges in the fields of competition, market and technology. The aim of our research was to discover the characteristic strengths of the innovative and successful enterprises. Furthermore it was important for us to find out the weaknesses and problems of the less successful enterprises. This paper proves the central results of our empirical survey.

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1. Introduction

The economic structure of Germany is undergoing radical changes brought about by far-reaching alterations in the global division of labour, a weakening and modification of demand trends and by the dynamics of technological and organizational innovation. These structural changes affect the craft enterprises as well.

New industrial and trading suppliers appear in the traditional craft areas and raise the competition pressure. Some products produced by the manufacturing industry and distributed by the trade (for example supermarkets) will take the place of traditional craft products. Installing - not producing - these products is the only task the craft enterprises will be necessary for. Besides the traditional products the new suppliers often provide attractive new products and additional services. The customers on the demand side expect a great deal from the craft enterprises: more quality, reliability and individuality. Services like consulting, maintenance and assembling will be more important in the future.

In the past craft enterprises mastered these challenges in the competition, in the market and in the technology. Moreover, the craft enterprises are responsible for many innovative products, processes and services as well as for the preservation of jobs and the creation of a large number of new jobs. Therefore they can be called a mainstay of the German economy.

The aim of our research was to find out the craft enterprises in the area of Reutlingen which have successfully mastered these challenges within the last years. Furthermore it is important to know something about the problems enterprises had with the adjustment to the structural changes. Discovering and analysing the weaknesses is the necessary condition to remove these weaknesses and to be successful on the markets in the future.

Especially innovative enterprises are expected to have competitive advantages in opposition to enterprises that are not innovative. With new products and services they satisfy the customer's demand or create the latent demand of new customers. The introduction of new production techniques allow them to raise their productivity and to reduce their costs. In our study (Herdzina & Nolte & Hegner, 1996) we wanted to discover the characteristics of these innovative leaders.

2. The methodology of the survey

2.1 The investigated craft enterprises

This paper is based on a study of craft enterprises in the agglomeration oriented area of the Chamber of Handicrafts Reutlingen nearby Stuttgart, a highly industrialized region in Baden-Württemberg. This area includes the administrative districts Freudenstadt, Reutlingen, Sigmaringen, Tuebingen, Zollernalb. The study was supported by the local Chamber of Handicrafts.

In the second half-year of 1995, 566 selected craft enterprises (5% of all craft enterprises in this area) were approached to fill out our questionnaires about their innovation behaviour. 133 craft enterprises - this represents a response rate of 23% - replied and could be used for our analysis.

The response rate of nearly 25% combined with the minimal deviations with the branch structure of the examined enterprises compared to the parent population allowed us to deduce representative and qualitative statements and conclusions from this empirical study.

2.2 The classification of the especially successful enterprises and the less successful enterprises

The empirical survey suggests to divide the examined craft enterprises in two groups. The first group consists of the especially successful enterprises. They show two typical characteristics:

1. **increase of sales volume:** their increase of sales volume between 1989 and 1994 was more than 50% higher than the average increase of sales volume in their branch in Baden-Wuerttemberg.
2. **existence of innovation activities:** between 1989 and 1994 the enterprises either invented new products, new services or new production processes.

A small group of especially successful enterprises prove these two criterias. Only 30% of the examined enterprises belong to this group. Therefore, we call it the top 30 per cent. In the

following bivariate and multivariate analysis these especially successful innovative enterprises are focussed.

The remaining 70% of the examined enterprises are the less successful enterprises. At this point it is to underline that they are not unsuccessful. They just failed to fulfill at least one of the criterias mentioned above.

The empirical survey shows three fundamental and valid patterns of success and failure concerning the differences between the top 30 per cent and the other enterprises.

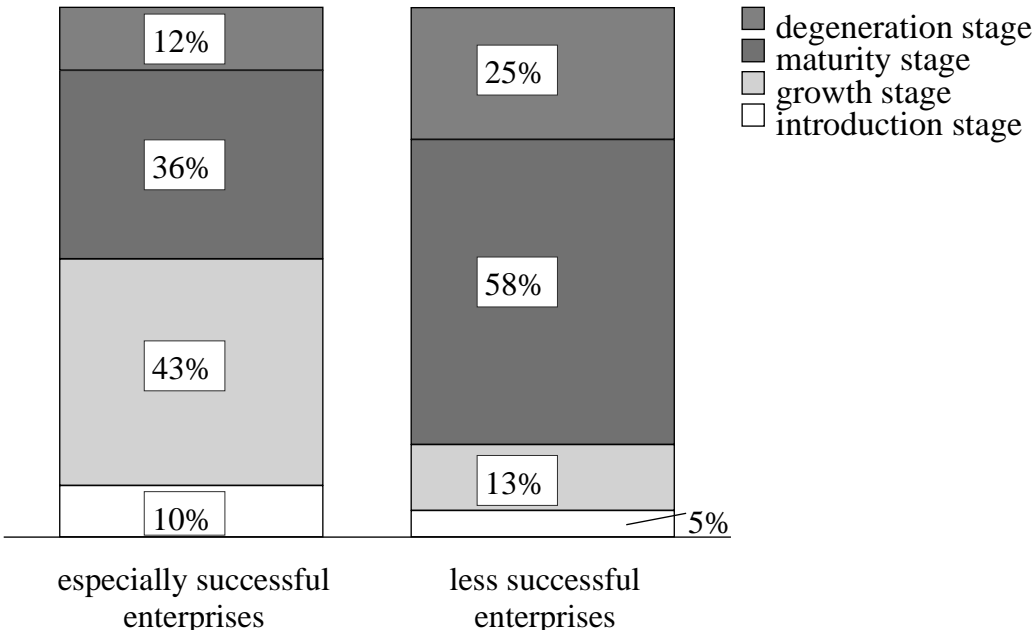
- The **attitude to risk**, which is proved by the choice of the growth strategy and the regional extension of sales markets.
- The **innovative competence**, i.e. the existence of activities in the areas of research and development, construction and design, business planning and staff development.
- The **willingness to learn and the acquisition of knowledge**, i.e. the employees' capability and readiness to take up know-how and to realize innovations with this know-how.

2.3 The innovation activities in the successful enterprises

According to our criterias all especially successful craft enterprises are innovative, i.e. they have between 1989 and 1994 either invented new products or new services or new processes. Half of the less successful enterprises are innovative indeed, but these innovation didn't bring out the necessary increase of sales volume. The other half of the less successful enterprises didn't invent any new product or new service or new process.

A characteristic for the success of the top 30 per cent is their capability to continuously rejuvenate their product and service programme. The product life-cycle (Heuss, 1965) is a good instrument to prove this. The especially successful enterprises are able to replace „old“ products and services in the degeneration stage of the product life-cycle with „new“ products and services in the introduction and growth stage of the product life-cycle. With these innovations they realize a sales volume of 53%, whereas they realize a volume of 12% with „old“ products and services. In contrast to this the less successful enterprises have too many „old“ products and services included in their programme (sales volume of 25%) and only a small number of products and services in the introduction and growth stage (sales volume of 18%).

Fig. 1: The product life-cycle of the especially successful and less successful enterprises in the area of the Chamber of Handicrafts Reutlingen



3. The strengths of the especially successful and the weaknesses of the less successful enterprises

3.1 Attitude to risk

The first characteristic which shows the considerable differences between the top 30 per cent and the other enterprises is the enterprises' attitude to risk. Innovations are risky and incident to high costs. Therefore the chosen growth strategies, as combinations of present products and present markets or new products and new markets (Ansoff, 1966), can be an indicator of the attitude to risk.

As innovative growth strategies can be called

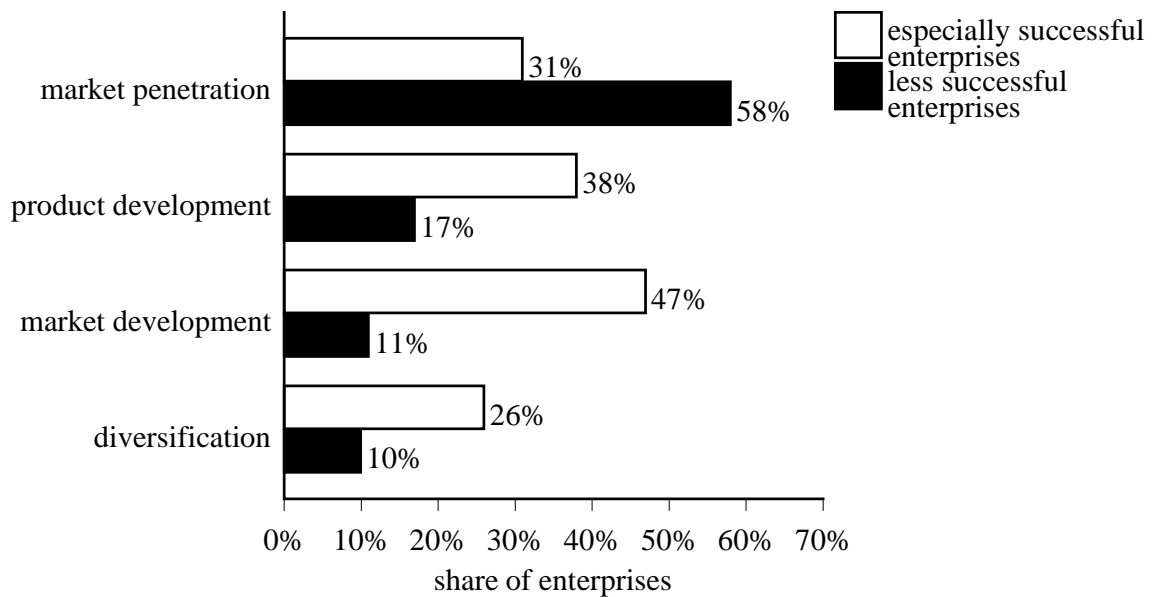
- the market development (new markets are opened up with existing products)
- the product development (new products are to be offered in already opened markets)
- the diversification (new markets are penetrated by new products)

The market development and the product development are bound up with nearly the same risk. The diversification means the opening of new and unknown markets with new products and services. Because of this, it is the strategy with the highest risk. At long last this strategy can help the enterprises reducing and equalizing their risks.

Market penetration is a characteristic of a non-innovative or security strategy. With this strategy the enterprises try to intensify their activities with the current product programme on already opened markets. Choosing this strategy signifies a small attitude to risk.

Our survey shows that, within the innovative growth strategies, the especially successful craft enterprises prefer the market development. 47% of the top 30 per cent grow with the current product programme on new local markets or on additional markets. They find out a new use or new users for their products. The strategy of product development is pursued by 35% of the successful enterprises and 26% of the top 30 per cent enterprises chose the diversification. They risk the launching of new products on new markets.

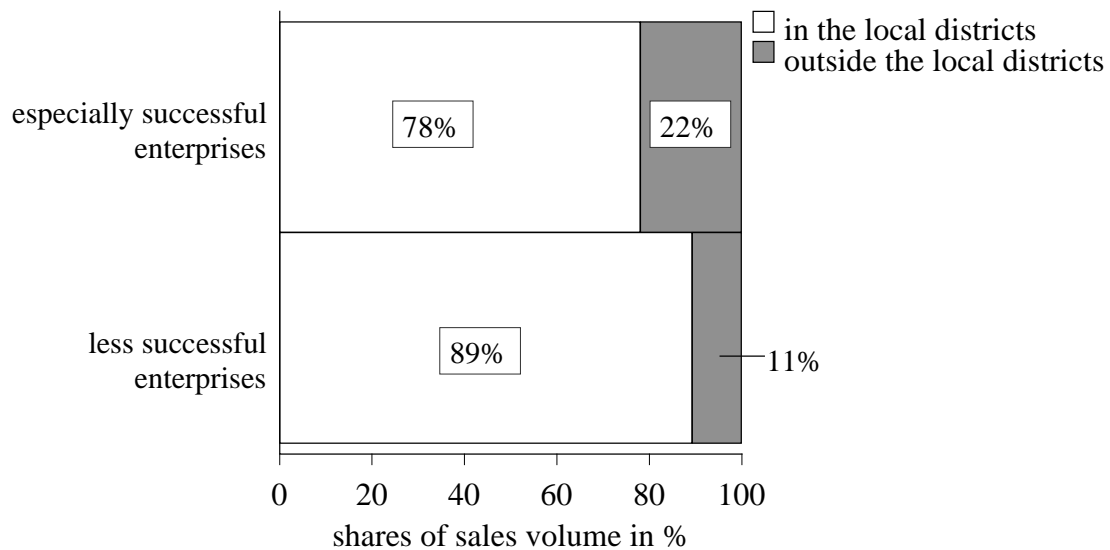
Fig. 2: Growth strategies of the craft enterprises in the area of the Chamber of Handicrafts Reutlingen



The survey shows that the less successful craft enterprises stay behind regarding the three innovative strategies. Only 11% chose the market development, 17% chose the product development and 10% settle on the diversification. Their main focus (58% of the less successful enterprises) lies on the market penetration. They try to grow on already opened markets with the increase of the consumption rate of their „old“ products or with the contracting away customers from competitors. These activities will only be successful with extremely low prices for the products and services.

A further characteristic of the attitude to risk is the regional extension of sales markets. With an increasing regional extension of the sales markets the risk for the craft enterprises will increase, too. The especially successful enterprises are able to realize 22% of their sales volume outside their local district. In opposition to his the main activities of the less successful enterprises lie on the local markets. They realize only 11% of their sales volume outside their local districts. The innovative enterprises succeed in gaining new customers with their supply of new and reasonable priced products. Moreover the increasing regional extension of sales markets as well as the earning and experience effects will raise the capabilities and the attitude to innovation in the enterprises.

Fig. 3: Regional extension of sales markets of the craft enterprises in the area of the Chamber of Handicrafts Reutlingen

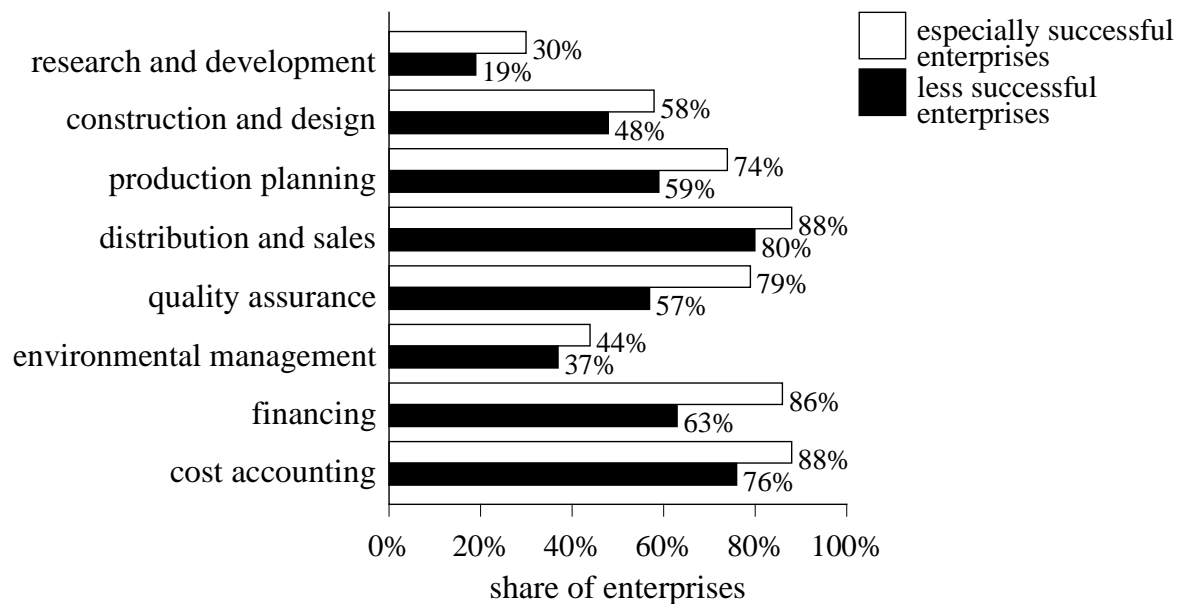


3.2 Innovative competence and qualification

Innovation success requires the analysis and long-term prognosis of the external conditions as well as the ability to solve problems creatively (Coombs & Saviotti & Walsh, 1987; Freeman & Soete, 1997). These, in turn, require not only the knowledge of the suitable technology and good analytical abilities in technical and business fields but also the willingness to use these capabilities for the innovative formulation of questions. It also presupposes the availability of high qualified employees. The existence of activities in the areas of research and development, construction and design and business planning (especially production planning, distribution and sales, quality assurance, environmental management, financing and cost accounting) are decisive building blocks with regard to innovation success in the market.

If these innovative competences are not available in the enterprise the readiness and the interest in innovation and changing processes will be low. Because of the lack of experience in gaining and managing of know-how inside the enterprise, the development of new products and services and the use of new technologies will be comparatively difficult.

Fig. 4: Innovative competences of the craft enterprises in the area of the Chamber of Handicrafts Reutlingen



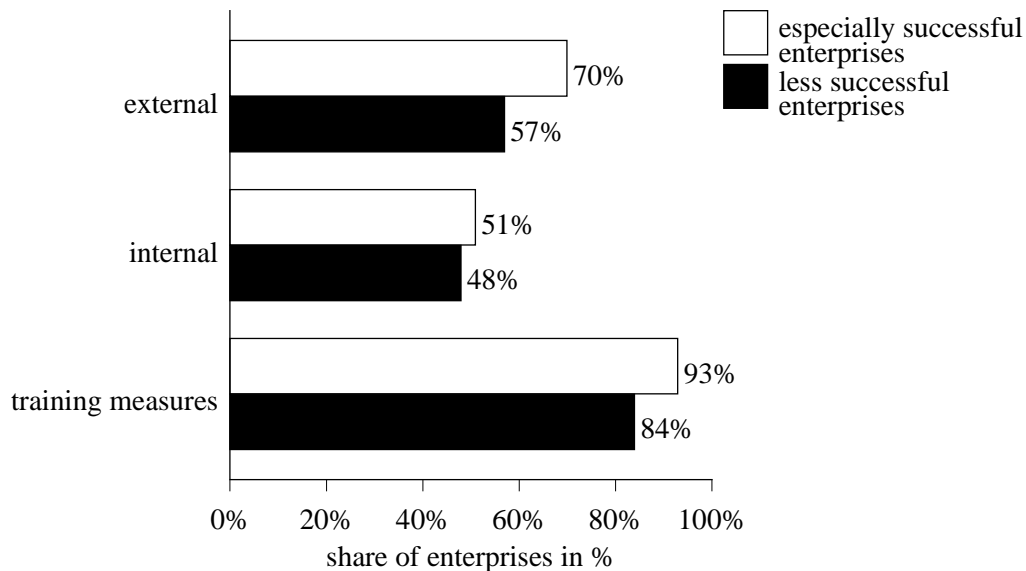
Corresponding to this hypothesis, the especially successful enterprises have a significant advantage with regard to the strategic planning of the production and innovative activities. Nearly 75% of the top 30 per cent (others 59%) are carrying out these activities. In the areas of construction and design (58%; others 48%) as well as research and development (30%; others 19%) of new products and services the especially successful enterprises have a similar advantage. Moreover these innovative leaders don't only see the technical possibilities. The management activities like quality assurance (79%; others 57%), financing (86%; others 63%) and cost accounting (88%; others 76%) are also very important for these enterprises.

The especially successful craft enterprises attach a special significance to high qualified employees. This is proven by the fact that 72% of the top 30 per cent (others 37%) engaged specialist staff within the examined time period. On the one hand, this could have been the result of their success in the market and their expansion. On the other hand they could have considered this measure as a condition to be successful in the future. These facts explain the significance of successful and innovative enterprises for the region's labour market (Maas, 1990; Tödtling, 1990).

It is not only the qualification learned in the professional training that is important for the success of the adjustment on the changing conditions and the innovative behaviour. It is moreo-

ver the permanent know-how renewal with training measures, that is necessary. Regarding staff development, the especially successful craft enterprises have the lead, too. Comparing the especially successful with the less successful enterprises, the differences are remarkable regarding the external training measures (70% : 57%).

Fig. 5: Staff development measures in the area of the Chamber of Handicrafts Reutlingen



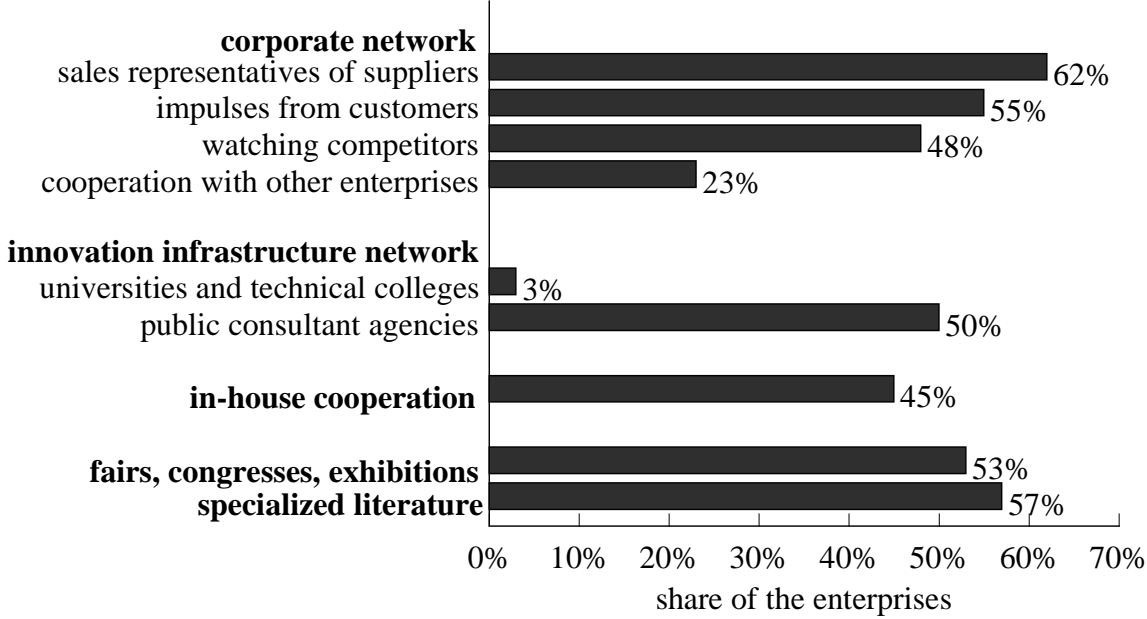
3.3 Willingness to learn and acquisition of knowledge

Apart from the expansion of existing knowledge, searching, collecting and utilizing of new information about market orientated technical trends are main preconditions for the innovation success (von Hippel, 1988). The searching craft enterprises have several options to use information sources serving or imparting information relevant to innovation.

The enterprises can pick up new informations through the corporate network. This network includes impulses from customers, informations from the sales representatives of suppliers, observation of the competitors and use of cooperations with other enterprises. Institutions that are part of the regional innovation infrastructure like universities, colleges as well as consulting agencies of chambers and guilds can also act as an intermediary for innovation-relevant information. Other information sources are the employees' knowledge and creativity (in-house cooperation) as well as fairs, congresses, exhibitions and specialized literature.

The most important sources of information to further innovation are the dialog with the suppliers' sales representatives (62%), the specialized literature (57%) and the impulses coming from customers (55%). As information sources the especially successful enterprises prefer the active dialog with customers (67%), the observation of competitors, the visit of fairs, congresses as well as exhibitions and impulses from the suppliers' sales representatives (in each case 58%).

Fig. 5: Innovation-relevant information sources in the area of the Chamber of Handicrafts Reutlingen



As a source of innovation-relevant information the well developed innovation infrastructure in Baden-Wuerttemberg plays a minor role. Especially universities and colleges have a low significance. They represent a high potential of information the enterprises can benefit from without increasing costs.

4. Conclusion

The results of this study primarily intend to activate the discussion about innovation and innovation orientated activities in small and medium sized enterprises. Therefore, it is important to watch the empirically discovered strengths of the especially successful and innovative enterprises. 30% of the examined enterprises belong to the homogenous group of especially successful innovators. They were able to master the challenges in the fields of competition, market and technology between 1989 and 1994 clearly better than their competitors.

The study shows one crucial result. If there is a recipe for success of the innovative and successful enterprises then the following one: Compared with the less successful enterprises, the top 30 per cent have a stronger attitude to risk, more innovative competences and a higher willingness to learn. The differences are also emphasized by the fact that successful enterprises formulate questions - not only at the beginning of the renewal process but during all their activities. By doing so they question about themselves and their traditional way of solving problems. They organize a permanent knowledge exchange.

The especially successful enterprises also care about how to be successful in the future in changing conditions. They think about creative development, new labour organizations, new customer relations and new supplies of products and services. To realize these changes is only possible if the enterprises get new and innovation-relevant information and have a special creativity and readiness regarding innovation.

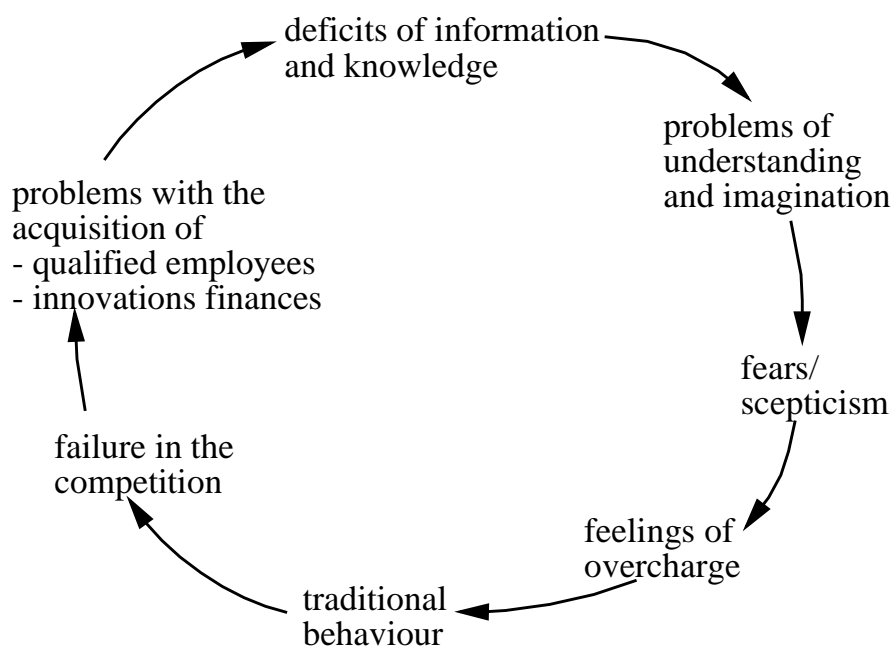
This pattern of success and failure across the shown number of pairs of determinants provides a systematic evidence for the validity of our presented hypotheses. A foundation for our theoretical work is also delivered by a multivariate logistical regression analysis. The used logistical regression type reveals an interesting set of characteristics which facilitate innovation activities in small and medium sized enterprises (for further details to the used regression type see Nolte, 1996).

Tab. 1: Results of the logistical regression analysis

Independent variable: successful innovative activities of craft enterprises			
predictors: success factors	regression coefficient	"odds-ratio"	significance
risk to attitude			
constant factor	-1,4118		0,0001
– market development	1,8480	6,347	0,0001
– product development	0,7671	2,154	0,0998
innovative competence and qualification			
constant factor	-2,1434		0,0001
– engagement of specialist staff	1,4129	4,108	0,0006
– competence in quality assurance	0,9179	2,504	0,0416
willingness to learn and acquisition of knowledge			
constant factor	-1,1896		0,0001
– impulses from customers	0,7727	2,166	0,0463

In conclusion, visionary and thoughtful businesses know that they have to break the vicious cycle of failure:

Fig. 6: Vicious Cycle of Failure



So the time has come for the innovative capacities of businesses and political bodies to turn their focus on this conception of what market economy should be. Therefore, the majority of small and medium sized firms as well as regions will be able to benefit from a greater awareness of the relevant determinants and barriers to a successful innovation shown in this study.

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