INNOVATION of the INTEGRATED PRODUCT and PROCESS DEVELOPMENT by WOIS

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Especially for maintaining leadership, company's require strengthening the innovation power. Consequently companies necessitate a clear picture of the company's competitive situation in future as well as reliable innovation processes for heading towards this future in a focused way.

The innovation strategy WOIS combines these elements in a unique Contradiction Oriented Innovation Strategy by integrating key elements of known successful methodologies such as TRIZ with new aspects of encouraging a challenging innovation culture, designing highly competitive value creation chains and realising successful innovations in known and new created markets.

Partners that have already applied this innovation theory successfully are companies such as BMW, Bosch, Braun, Linde, Melitta, Nestlé Schöller, Ergoline, Grohe, Hilit, Siemens, Tesa and many others.

The combination of the innovation strategy WOIS with the company management throughout the value creation chain can offer the chance to unveil an extraordinary innovation power.

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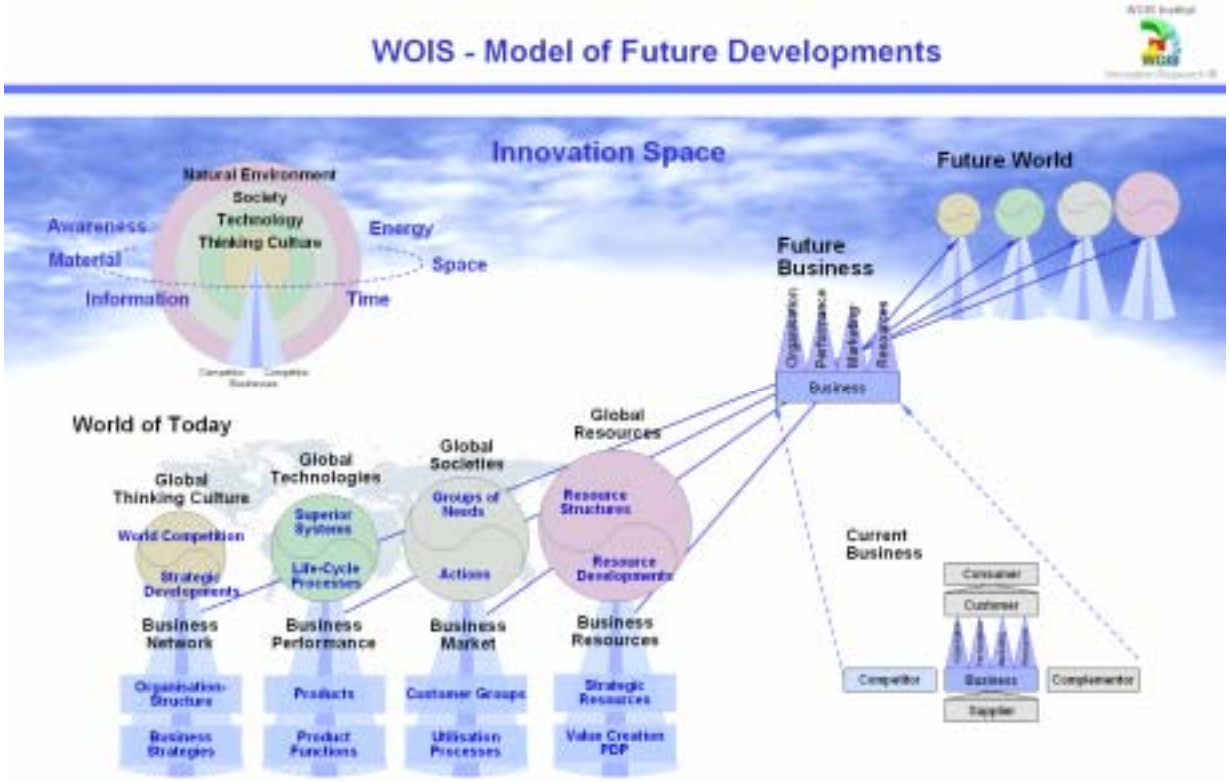
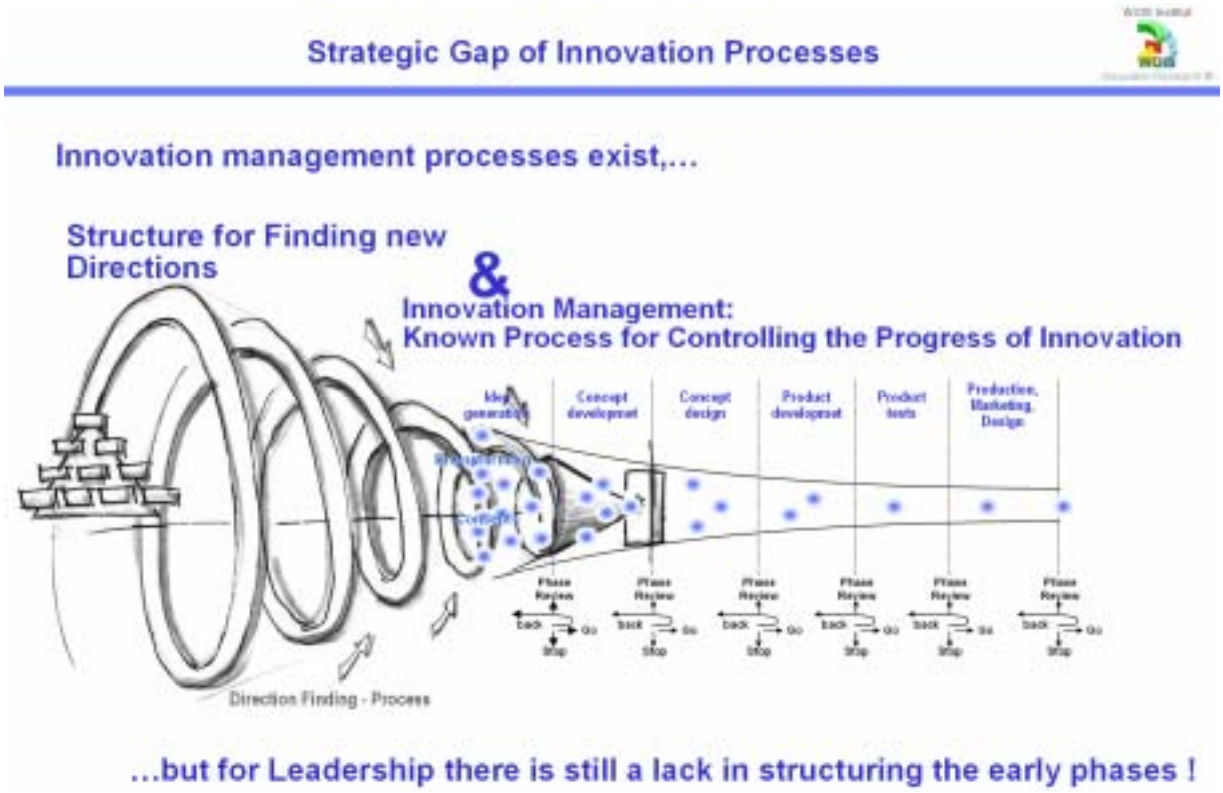
Further Development of the World:
Especially for long term success company's requires a clear picture of the future competitive situation as well as reliable innovation processes for heading towards this future. In particular "weak signals" become important as it is likely that they end up having "strong impacts".
The key questions become:



Were to look and how to inspire new development directions?
For building a sustainable picture it is important to consider how the society, technology, resources and the thinking culture will develop. All four aspects will develop, including their interdependencies, no matter whether "our company" contributes to the future development or not.
Consequently the challenge will become to influence this development in a way that we design and meet future expectations of the markets. Facing this task from a business point of view:

Who is responsible for turning the switches towards the right tracks?
Is it only the management of the company? Frequently the top management faces a lack of detailed information. Therefore the decision making basis is not as accurate as desirable.
On the other hand it could be asked if employees with too little decision making empowerment and too little overview should take the decisions?
Throughout the industry detailed descriptions exist for all kinds of business processes. Often, future perspectives are developed based on 'roadmaps' that result from evaluating spontaneous ideas, former project results and preliminary concept proposals.
But this is not sufficient for developing a clear picture for the future of the business.



It can be observed, that many companies are confronted with a threatening gap especially within the early, strategic phases of development processes. The importance and impact of defining repeatable and reliable approaches for initiating strategic innovations is frequently underestimated.

One might think that companies that fail in defining sustainable strategic approaches will suffer considerable disadvantages - but due to similar behaviours of the competitors this is not the case.
Nevertheless, significant advantages can be gained through implementing systems that permanently allow the flexible adaptation of the development program, without loosing the clear focus for medium and long term targets.

But how to fill the strategic gap? What can be the scientific basis for doing so?
In times of multi-criteria problems, company over spanning development networks and ever faster development processes, it is essential for companies to ground significant decisions on a reliable sustainable decision basis.
Especially 'stock market governed' company's belief in 'management by financial target agreements', but fail in implementing the ability for developing future perspectives. They are dead-locked in efficiency programs, unable to develop and implement strategies for future wealth creation.

Future orient companies require a system that consists of a

- growth oriented economical model,
- an energy focusing philosophy,
- a culture of a commonly shared understanding concerning future challenges and
- knowledge about hidden pattern of competition.

The innovation strategy WOIS integrates these aspects into one powerful strategy.

Is there a need for yet another approach?

When studying the literature hundreds of tools, tactics, methodologies exist for a wide range of situations. But there is no approach that would support business, marketing, product, process, organisation and resource innovations from the early strategic definition phases to its market implementation.

It is the intention of WOIS to provide a flexible mental model and innovation technology for innovation leadership, by supporting the processes required for recognising and realising innovative shortcuts in a more focused way.

How to Leaver Effective and Efficiency Approaches?
During the last years it became a strong tendency throughout Europe that companies as well as government programs became ever more efficiency oriented.
Efficiency measures bear the advantage of being easily measurable. In addition they are useful to demonstrate short term quick wins.

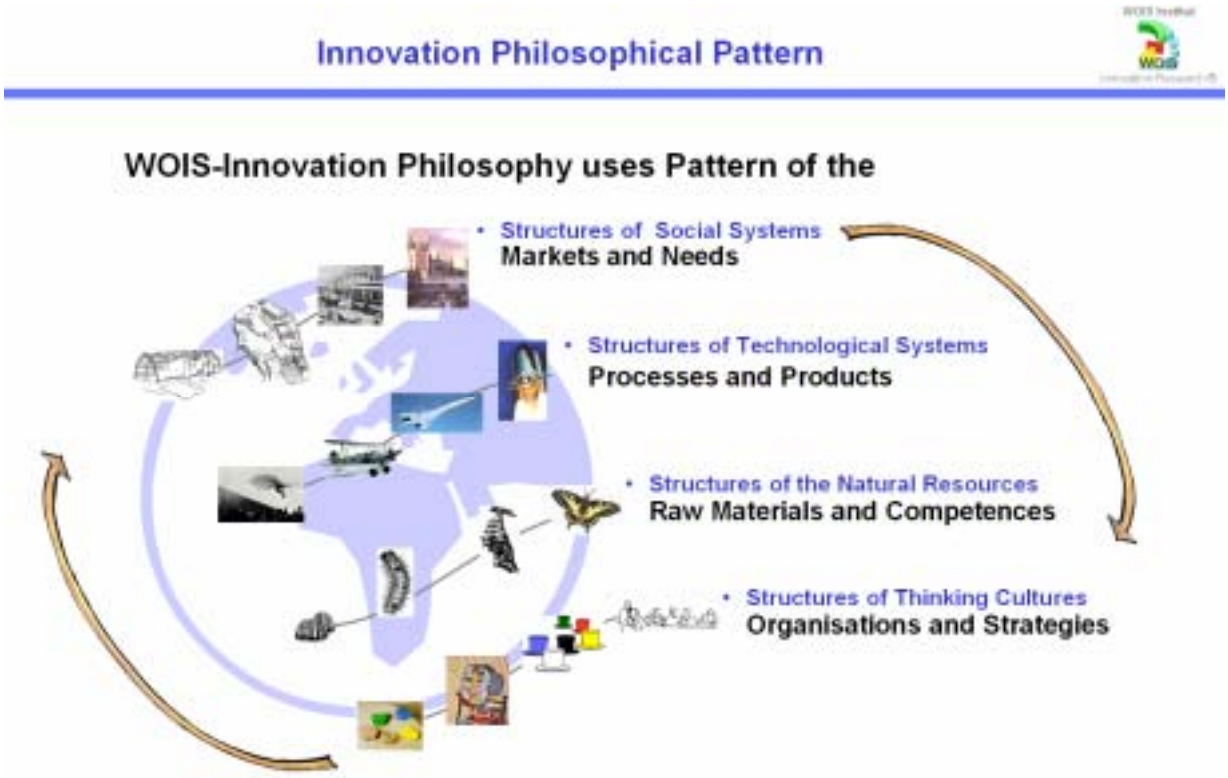
Unfortunately it is the nature of efficiency instruments to work toward a natural limitation. Without creating additional benefit - and thereby increasing the effectiveness - there will be no long term success.
It is a reoccurring pattern of market evolution that competitive systems become more and more optimised and at the same time less differentiated. Unfavourable price competitions are the result of such developments until one of the competitors breaks the barrier of similarity. This usually happens by introducing a significantly changed solution that is characterised by new functionality and therefore also new benefit.

What Tools, Technologies and Methodologies already Exist?
A wide range of tools and methods exist to assist development processes.
Most popular tools aim at reducing the effort and “ensuring against failure” -
in principle following the line of argumentation “It cannot be my mistake I am certified”.
Nevertheless, companies do not gain leadership because they are not responsible and certified against mistakes, but due to people that are responsible for the success.
Therefore, approaches are required that focus on generating new benefit prior to applying tools to minimise the effort.
As a consequence future oriented businesses first seek for solutions that offer new benefits for the customers before focusing on efficiency measures.

What Basic Science can be used as Background for Innovation?

Modern innovation processes must not rely on random intuitive ideas. They necessitate repeatable processes that increase the likelihood of delivering reliable short, medium and long-term perspectives with powerful corresponding concepts.

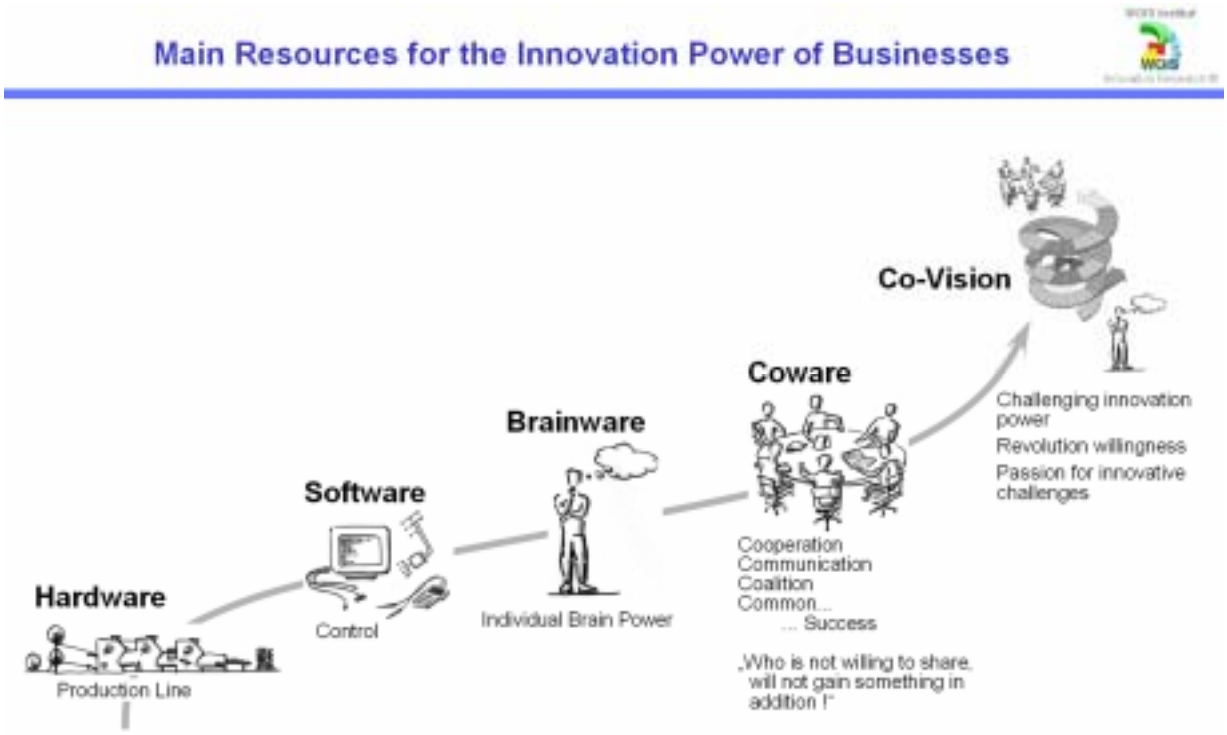
Searching for the common ground for modern innovation sciences it became obvious that neither engineering or economical sciences, nor natural sciences are a suitable basis as they do not incorporate all relevant aspects.



The origin of science is the philosophy. It defines basic interdependencies of the nature, society and thinking.
This broad view combines all relevant aspects of modern challenges, despite of the aspect of technology. Accordingly, a modern innovation philosophy needs to combine the aspects of social, technological, natural and thinking aspects.

Such a definition would be too general to be of any help for modern innovation processes. Nevertheless, specifying this definition shows that successful approaches need to consider the Co-Evolution of the markets and needs, products and processes, raw materials and resources as well as of the culture and strategies.

What Internal Resources can Increase the Innovation Power of Companies?
Beside the innovation philosophy also the resource basis of companies defines its competitiveness.
Modern hardware and software resources are the backbone of every business. Developing businesses additionally requires the people that are able to come up with unique, competitive ideas.



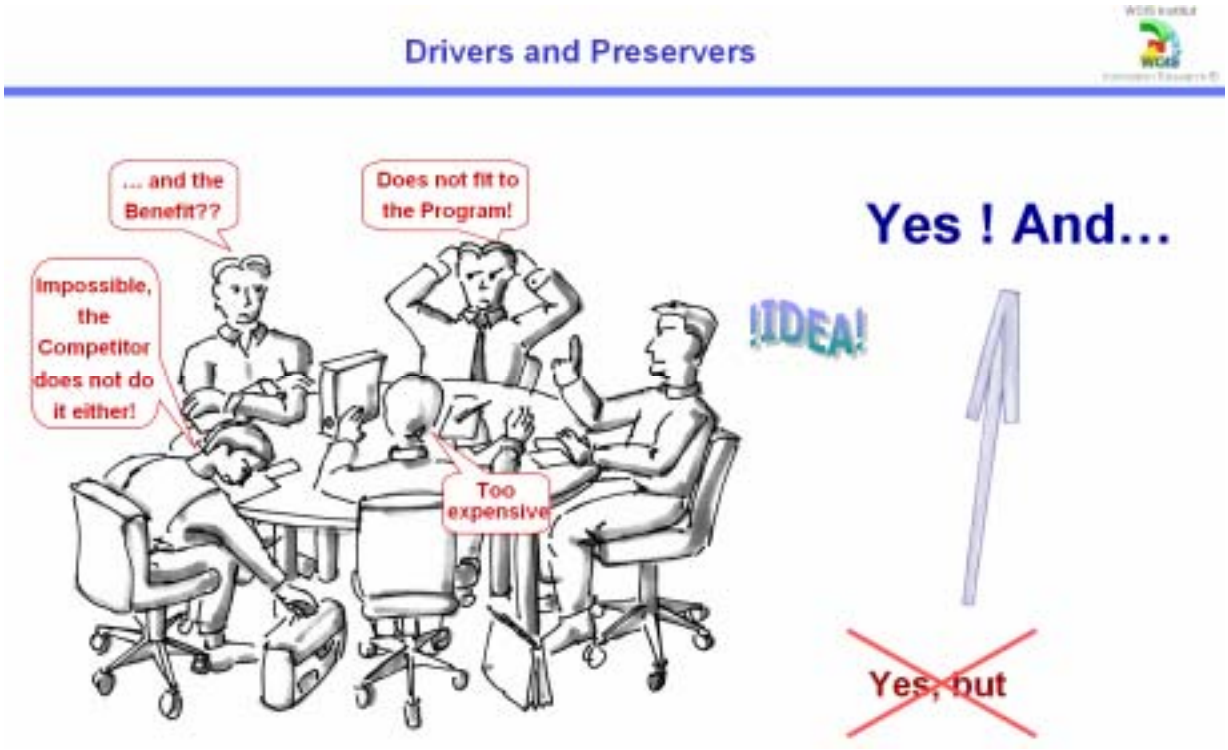
Nowadays the resource question became even more complex. Business relations need to cover so vast issues that it is nearly impossible for one person to integrate the brainpower to develop new ideas from the initial stage to its market introduction. This indicates at the same time, that the brainware of individuals is no longer the ultimate resource for business success.

It seems to be the ability of a business to implement a climate of coware - of cooperation, communication, contradiction, coalitions, common … - that characterises its potential for competitive change.
Despite of the cultural aspect of coware, forward thinking businesses are able to implement a challenging, resource focusing common vision that helps to align development activities toward a commonly shared target system.

How to Inspire a Positive Innovation Culture?

The western culture is based on logic and is, as a consequence used to assess and judge new ideas at once. This is helpful to prevent substantial misunderstandings and wrong conclusions.

The strength of logical conclusions during later development phases is at the same time the limiting factor for the early ones.

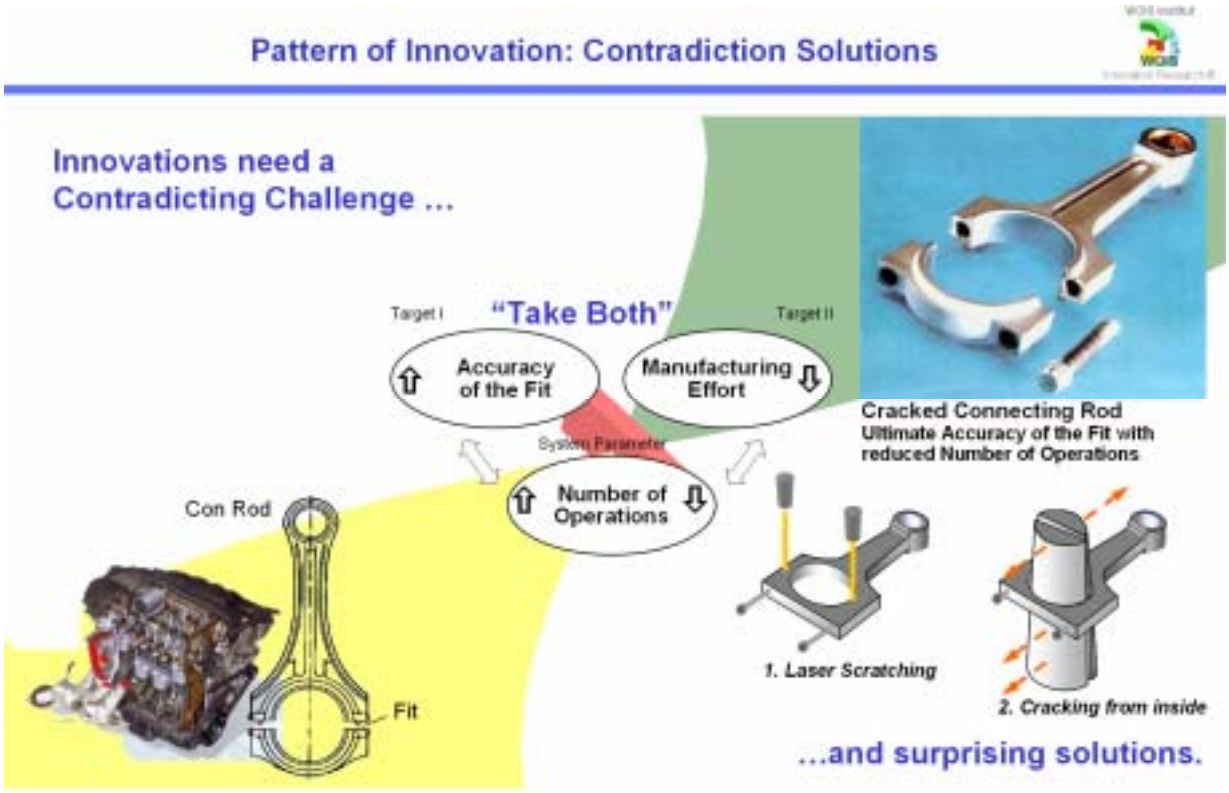


As soon as one comes up with a new idea, untrained people are used to start validation. At once all reasons are in our mind, why this new idea might not work.

Innovation processes require a climate that searches for the ‘good idea behind’ and to develop this seed to a growing plant.

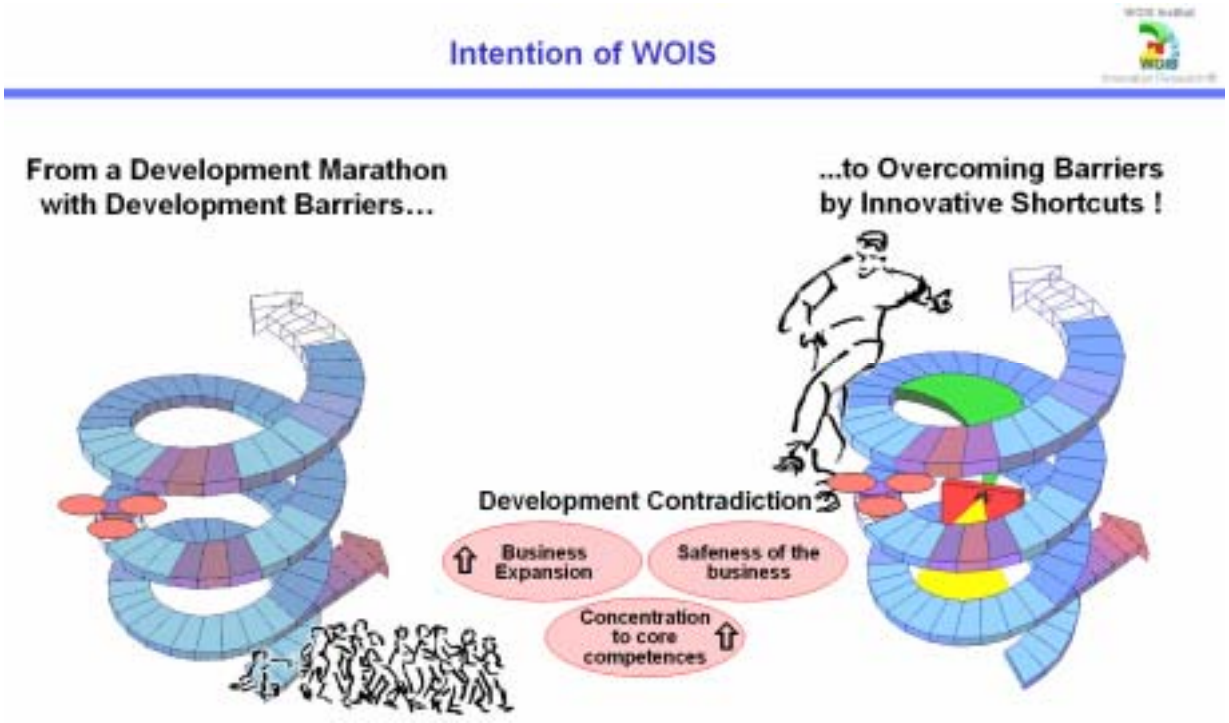
A simple, but most effective chance to switch this behaviour towards a more innovation friendly culture is replace the typical “yes, but” by a more future oriented “yes, and…”

How can - usually Negative - Contradictions Inspire Innovations?
Innovations break through current performance limits and thus also aim beyond current barriers and hurdles. The innovation strategy WOIS utilises this characteristic of innovations to focus available development resources on challenging such contradictions. By describing the logic of the constraints of existing leading edge systems the boundary of available technologies is characterised.
The example of a connecting rod development in 1991 of the companies Krebsöge and BMW shows the idea behind the model of development contradictions and its use to aim beyond existing boundaries.



The ever increasing efficiency of engines required the fit of the connecting rod to be machined ever more accurately.
At the same time the machining effort had already developed to a level that demanded a decreased manufacturing effort.
→ Such a situation describes a typical target conflict. The targets seem to contradict each other and target conflict management tools could assist in finding the most suitable compromise.
Real innovations are not based on compromises and the theory of WOIS provides a model that assist in overcoming such development contradictions.
WOIS searches for the reason behind the target conflict by defining a parameter that links both targets in a logic manner.
To increase the accuracy of the fit, the number of operations has to increase.
At the same time, to reduce the manufacturing effort, the number of operations has to be reduced as possible.
Now this is a typical catch 22 situation. The number of operations has to increase and decrease at the same time!

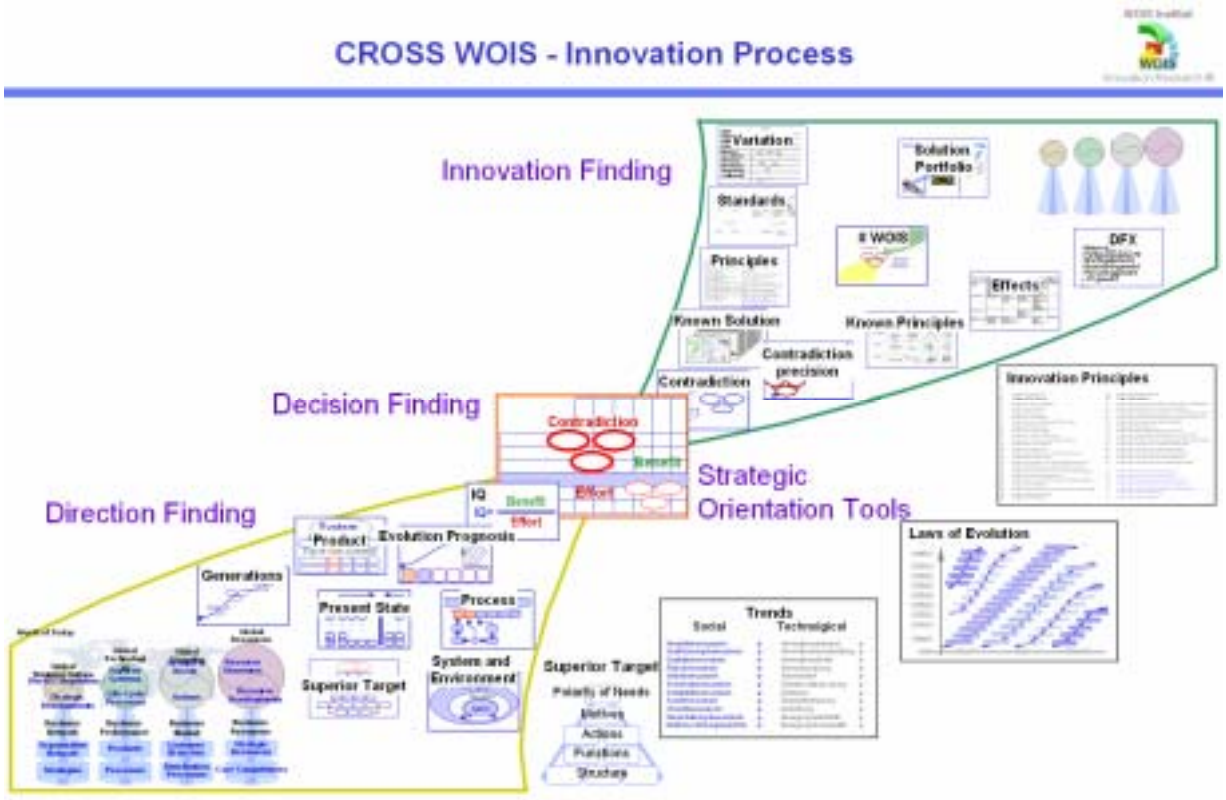
The approach of WOIS is to define the favoured growth direction of the parameter and to require the target to be fulfilled that is usually linked to the opposite growth direction.
In the case of the connecting rod there would be ideally no operation, but at the same time the accuracy of the fit as high as possible.
The solution to this paradox task was the development of a cracked connecting rod:
Realising the highest possible accuracy with only one machining operation.



The intension of shortcutting the track of evolution is the common intension of all competitors in the markets. The spiral of innovation is a model for discussing phenomenon the re-occur over and over again. The picture leads to a strategy for shortcutting the spiral of evolution in a more systematic but at the same time inspiring way.

What is the strategy behind the intension of shortcutting the spiral of evolution?
In general, the decision making processes can be described as a process of three distinct phases:

- An orientation,
- decision making and
- innovation-finding phase.



Knowing these phases is good, but not yet helpful for guiding a project team through a major innovation project.

Which elements are needed to run successful innovation projects?
For being able to allow chaotic association phases throughout the project it is essential to be able to rely on the governing overlaying process. Therefore, models exist for each of the phases that support project work with
- strategic orientation tools,
- distinct analysis perspectives,
- inspiration resources and
- models for deriving key findings.

When trying to consider developments of the society, technology, natural resources and global competition networks as well as there interdependencies:

What analysis process is able to guide a project team through such a journey without loosing the overview?
The experience with hundreds of projects has shown that the following process increases the likelihood of developing innovative results significantly:
Initially it is important to re-focus the own thinking perspectives.


- First, the analysis scope needs to be widened up. The “picture of the future” that was shown earlier on helps to identify the own key competences and threads developing towards the own business field.


- The creation of a picture of the system, its superior- and super-systems supports the subsequent …


- Superior Target definition. This process step helps to widen up the analysis scope without loosing the original target direction. At the same time it helps defining the content of the subsequent orientation phase.


- Starting with customer groups and their actions, the market field is researched for additional business opportunities and weaknesses of the current situation. The analysis is reinforced with Trends of Social Developments.


- This leads to an analysis from a business point of view, including the global competitive situation and core performance characteristics. Technological trends support the search for innovation potentials.


- By defining system boundaries, links into the environment, the super-system and the structure of the sub-systems the abstraction level of the later analysis phases are set.


- It is impossible to gain a feeling for developments by relying on a single snap-shot only. By analysing the characteristics of historical key developments it becomes easier to understand the current development level and to forecast likely future developments.


- Analysing the life cycle process, including “how the system is used” by direct customers and consumers it is most likely to identify possible new future benefits and thereby strong new marketing arguments.

Investigating current “business processes” results in efficiency potentials, new customer benefits and reorganisation potentials for new business concepts.


- Investigating modern systems ends in complexity dead looks frequently. By splitting the system in its “Top 10” sub-systems ensures not miss important aspects and splits the complexity at the same time.


- Knowing the key functions of the system it is possible to establish a present state table to then build up a …


- Preliminary “best solution”. It must not be possible to build this solution in reality, but it is an input to the …


- Development prognosis that uses the eight groups of laws of evolution to discuss likely development directions, current limits and possible shortcuts through the spiral of evolution.


- Throughout the entire process specific ideas become collected in an “Idea Pool”. The ideas behind the specific ideas are formulated as abstract Benefit and Effort or Risk Targets and their characteristics are listed as Parameters.


- Now, the Targets and Parameters are reviewed. Top Targets and interdependent parameters become transformed to Effectiveness and Efficiency Equations, resulting in a …


- Core Contradiction Matrix and therefore an overview to the key future-challenges.


- The solution finding phase uses Databases to known Contradiction Solutions and Principle Solutions for fulfilling technical functions for the identification of preliminary solution concepts.




- This phase uses also the most powerful elements of TRIZ, the Innovation-Principles, -Effects and -Standards for challenging current limits.


- Variation and Combination Technologies are used for building up a


- Portfolio of Short-, Medium- and Long-Term solution and, depending on the scope of the project a new view on the Identity, Vision, Mission and Strategy of the Business.

This is a detailed innovation process that can become adapted to the specific necessities of the project.

From an abstract point of view, what are Key Success Factors for Innovation?
Managing Professional Strategic Innovations needs to integrate three Leading Core Competences for Innovation:

- Knowledge on Innovation Sciences as a theoretical basis
- Models for finding High Potential Future Directions as common process basis and
- Innovation Technologies for identifying key barriers and innovative perspectives as process support.

It is only the combination of these pillars that sustains competitive Leadership by generating the required continues growth.

The following companies use the scientific background of WOIS and its Innovation Technology to innovate their business:

Prof. Dr.-Ing. Hansjuergen Linde, University of Applied Sciences, Germany
is founder of the "WOIS-INSTITUTE", a consultant company for innovation research and business development with partners in many different branches, including companies such as BMW, Siemens, Bosch, as well as SME's.
He is professor for innovation theory, development and design at the WOIS Innovation School in Coburg.
He studied mechanical engineering and focused his PhD on invention theory. Subsequently he worked in industry for more than 15 years. When being promoted in 1991 he started researching, especially focusing on Direction Finding Processes and Integrative Innovation Development Models.
In parallel he started to work as partner in more than 100 product, process, organization and new business development workshops for industry.
He is involved in many innovations and patents. Prof. Linde is author and co-author of numerous publications.
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He worked in numerous WOIS projects.
In parallel he is scientific staff member of the laboratory for innovation technologies and lecturer in the school of interior design and integrated product development since 2000.
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