

Business Model Innovations

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Introduction

Fast information explosion and its global business application leads to the higher specialization and fragmentation of the research fields. Many new knowledge, technologies, materials and innovations are coming to the market in shorter time cycles and the engineers have to solve more complex products and processes under the higher time pressure (Fig.1.)

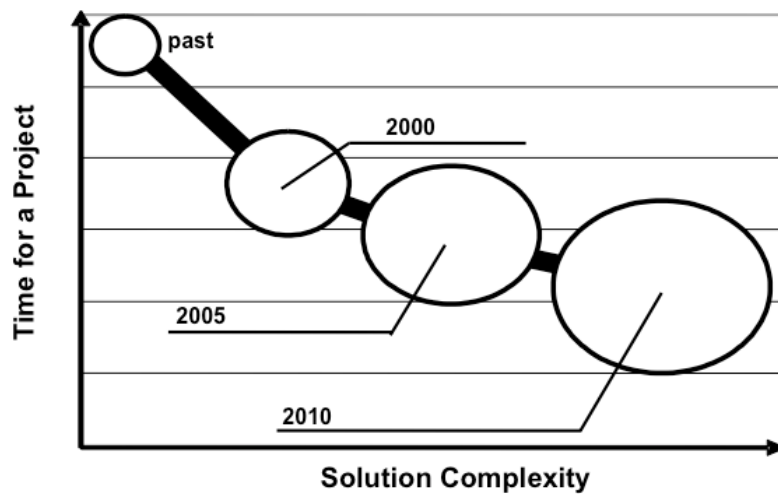


Fig.1. Time pressure and complexity increase

In the framework of the Research Project Performance of Enterprises, Public Sector Institutions, Clusters and Regions (Reg. Number : CZ.1.07/2.3.00/ 20.0147) On the Thomas Bata University were analysed the main theoretical trend and practical issues in the area of business models and their innovations (Fig.2.)

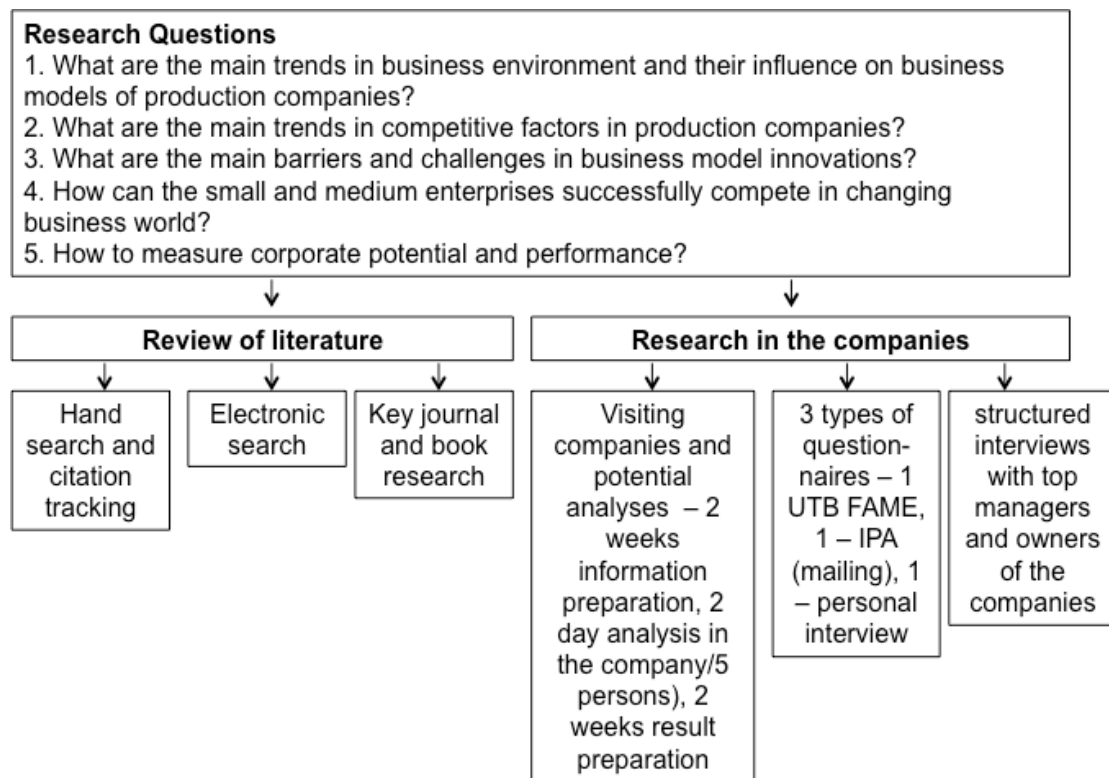


Fig. 2. Research methods

The growing number of publications about business models start between 1998 and 2001, but the first use of this term documented Osterwalder, A., et al (2005) in 1957. The business model theory and practice develops in parallel with the entrepreneur's knowledge and organizational structures for creating value by exploiting external opportunities and internal resources (e.g. Johnson, M.W. et al, 2008, Amit and Zott, 2001; Garnsey et al., 2008; Morris et al., 2005; Osterwalder, A, Pigneur, Y, 2010, Maurya, A, 2012).

Many definitions of business models have been proposed (Hamel 2000; Rappa 2006; Weill and Vitale 2001, Chesbrough and Rosenbloom 2000; Osterwalder et al. 2002; Mahadevan 2000).

Shafer, S. M., et al. 2005 have found 12 relevant definitions in established publications and 42 different business model components: unique building blocks or elements. Zott, Ch., Amit, R., Massa, L. (2010) reviewed 1177 papers focused on business models and identified different definitions and applications areas of business models. The authors deeply analysed 103 most relevant publications where they identified the common fundament of the business models:

1. The business model as a new unit of analysis
2. a holistic perspective on how forms do business
3. an emphasis on activities

Chesbrough, H. (2010) explored the barriers to business model innovation, including conflicts with existing assets and business models, as well as cognition in understanding these barriers. He described leadership of change and processes of

experimentation to overcome these barriers.

Johnson, M. W., Christensen, C., C., Kagermann, H. (2008) defined four element of the successful business model and advise these steps to determine whether your firm should alter its business model:

1. Articulate what makes your existing model successful. For example, what customer problem does it solve? How does it make money for your firm?
2. Watch for signals that your model needs changing, such as tough new competitors on the horizon.
3. Decide whether reinventing your model is worth the effort. The answer's yes only if the new model changes the industry or market.

Mark Johnson (2010) describes in his book *Seizing the White Space* (2010) the application of this concept to fulfill unmet customer jobs in your current market, to serve entirely new customers in new markets, or to respond to tectonic shifts in market demand, government policy, and technological capabilities that transform entire industries.

D.J. Teece (2010) writes, “that designing good business models is in part an ‘art’. The chances of good design are greater if entrepreneurs and managers have a deep understanding of user needs, consider multiple alternatives, analyze the value chain thoroughly so as to understand just how to deliver what the customer wants in a cost-effective and timely fashion, adopt a neutrality or relative efficiency perspective to outsourcing decisions, and are good listeners and fast learners.”

Demil, B., Lecocq, X (2014) analysed how business models and their innovations may disrupt competition and create competitive advantage and presented the rise and fail of an open business models.

Source	Business Model Definition	Business Model Purpose and Basic Ideas
Johnson, M. W., Christensen, C., C., Kagermann, H. (2008) <i>Reinventing your business model</i> . Harvard Business Review, 86, pp. 50- 59.	A business model consists of four interlocking elements that, taken together, create and deliver value – Customer Value Proposition (CVP), Profit formula, key resources and key processes.	Main opportunities and needs for business model change <ul style="list-style-type: none">- address needs of large groups who find existing solutions too expensive or complicated,- capitalize on new technology, or leverage existing technologies in new markets,- Bring a job-to-be-done focus where it doesn't exist.- Fend off low-end disruptors- Respond to shifts in competition.
Chesbrough, H. (2010): <i>Business Model Innovation</i> :	Business model enables companies commercialize new ideas and technologies	A business model fulfils the following functions: <ul style="list-style-type: none">1 - Articulates the value proposition- Identifies a market segment and specify the

<p>Opportunities and Barriers. Long Range Planning 43, pp. 354 – 363.</p>		<p>revenue generation mechanism</p> <ul style="list-style-type: none"> - Defines the structure of the value chain required to create and distribute the offering and complementary assets needed to support position in the chain; - Details the revenue mechanism(s) by which the firm will be paid for the offering; - Estimates the cost structure and profit potential - Describes the position of the firm within the value network linking suppliers and customers - Formulates the competitive strategy by which the innovating firm will gain and hold advantage over rivals.
<p>Scott-Kemmis, D.: Responding to change and pursuing growth: exploring the potential of business model innovation in Australia. Australian Business Foundation, 2012</p>	<p>A business model is how a firm creates value for customers, partners and itself. It is the firm's answer to the questions: what to produce, for whom and how to make money doing so.</p>	<p>A business model defines the who, what and how of the business architecture:</p> <ul style="list-style-type: none"> - Who are the targeted customers? - What is the value proposition offered to the target customers? - How is the offering generated and provided and how does the firm capture value from the business? <p>Opportunities for business model innovation emerge from changing consumer preferences, new regulations, new technologies and new potential partners. Growing competition, including from firms with new business models, is driving the need to become more focused and more responsive to new trends and to customer demands.</p> <p>Business Model Innovation need to become more focused and more responsive to new trends and to customer demands. Complexity and the pace of change increase the incentive for firms to collaborate. The web helps to lower the barriers to collaboration.</p>
<p>Shafer, S. M., Smith, H. J., Linder, J. C. (2005) The power of business models. Business Horizons, 48, pp. 199 – 207.</p>	<p>Business model as a representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network.</p>	<p>Business models enable an organization create and capture value and provide a powerful way for executives to analyze and communicate their strategic choices. Four problems of business models</p> <ol style="list-style-type: none"> 1. Flawed assumptions underlying the core logic. 2. Limitations in the strategic choices considered. 3. Misunderstandings about value creation and value capture. 4. Flawed assumptions about the value network.

<p>Zott, Ch., Amit, R., Massa, L. (2010): The Business model: Theoretical roots, recent developments, and future research. IESE Business School.</p>	<p>The business model depicts “the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities”</p>	<p>Business models have been mainly employed in three areas:</p> <ol style="list-style-type: none"> 1. e-business and the use of information technology in organizations 2. Strategic issues, such as value creation, competitive advantage, and firm performance 3. Innovation and technology management.
<p>Teece, D. J. (2010): Business Models, Business Strategy and Innovation. Long Range Planning 43, pp. 172 – 194</p>	<p>A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers.</p>	<ul style="list-style-type: none"> - Business models as competitive advantage - Business models as strategy deployment - Capturing value from technological innovation - Business models as innovation <p>To be a source of competitive advantage, a business model must be something more than just a good logical way of doing business. A model must be honed to meet particular customer needs.</p> <p>Great technological achievements fail commercially because little, if any, attention has been given to designing a business model to take them to market properly.</p>
<p>Osterwalder, A., Pigneur, Y. (2010): Business model generation. A handbook for visionaries, game changers, and challengers, Hoboken</p>	<p>A Business Model describes the rationale of how an organization creates, delivers and captures value."</p>	<p>9 building blocks that constitute the business model:</p> <ol style="list-style-type: none"> 1. The value proposition of what is offered to the market; 2. The segment(s) of clients that are addressed by the value proposition; 3. The communication and distribution channels to reach clients and offer them the value proposition; 4. The relationships established with clients; 5. The key resources needed to make the business model possible; 6. The key activities necessary to implement the business model; 7. The key partners and their motivations to participate in the business model; 8. The revenue streams generated by the business model (constituting the revenue model); 9. The cost structure resulting from the business model.
<p>Zelený, M.:</p>	<p>Through the</p>	<p>The minimum organization (not structure) of a</p>

Human Systems Management. World Scientific Publishing 2005	innovation cycle UDIO, the business explicitly uses its Understanding of customer needs and how to use resources to create a Design which is then developed and Implemented entering the Operate phase.	corporation is self-producing (autopoietic), cyclical, organizationally closed (autonomous) and structurally open (coupled with its environment). It provides a foundation of the biocycle of business. Each business has to coordinate at least four basic processes: Customer (C), Innovation (I), Processes (P), and Money (M).
Linde,H., G.Herr, A.Rehklau: WOIS - Contradiction Oriented Innovation Strategy, Wois Institut Coburg 2005	WOIS Business model consists 5 elements – value creation, market/customers, product/service, organization/processes and resources.	Strategic business model innovation in three phases: 1. Current business model analysis 2. Future business model definition 3. Defining and overcoming the contradictions and barriers between current state and future state
Maurya,A.: Running Lean. O'Reilly, 2012	Lean CANVAS business model is a focused on entrepreneurs and navigation of their way from ideation to building a successful startup	Lean Canvas for startups: 1. Customer segments 2. Unfair advantage 3. Channels 4. Value proposition 5. Solution 6. Key metrics 7. Problem 8. Cost structure 9. Revenue streams

Tab.1.: Summary of the literature review

Basic conclusions from the research

- Many companies are focused on the traditional cost saving strategies, increasing process productivity or product innovations, but they have problems in balancing of all the elements of the business model and network optimisation between the individual corporate business models (Fig.3.).
- Corporate business models are managed as the static, mechanical and linear processes and they waste time, money, and effort building the wrong product without receiving real feedback from the customers.

- Strong standardization and process organisation, bureaucracy, many audits and inspections, fear of taking the risk in innovations limit flexibility and fast responsiveness on external market opportunities. Corporate managers often try to optimize the visible structure of the company and don't really understand its invisible real organisation (Fig.5.)

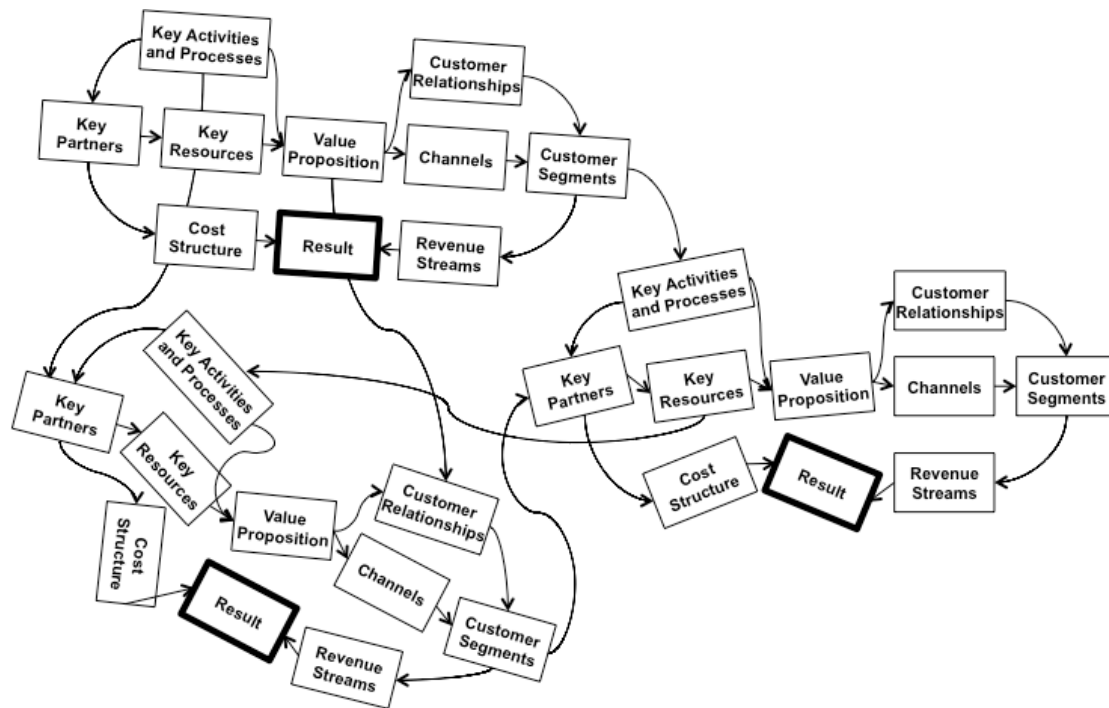


Fig.3. Dynamic Balancing of the Business Model Networks

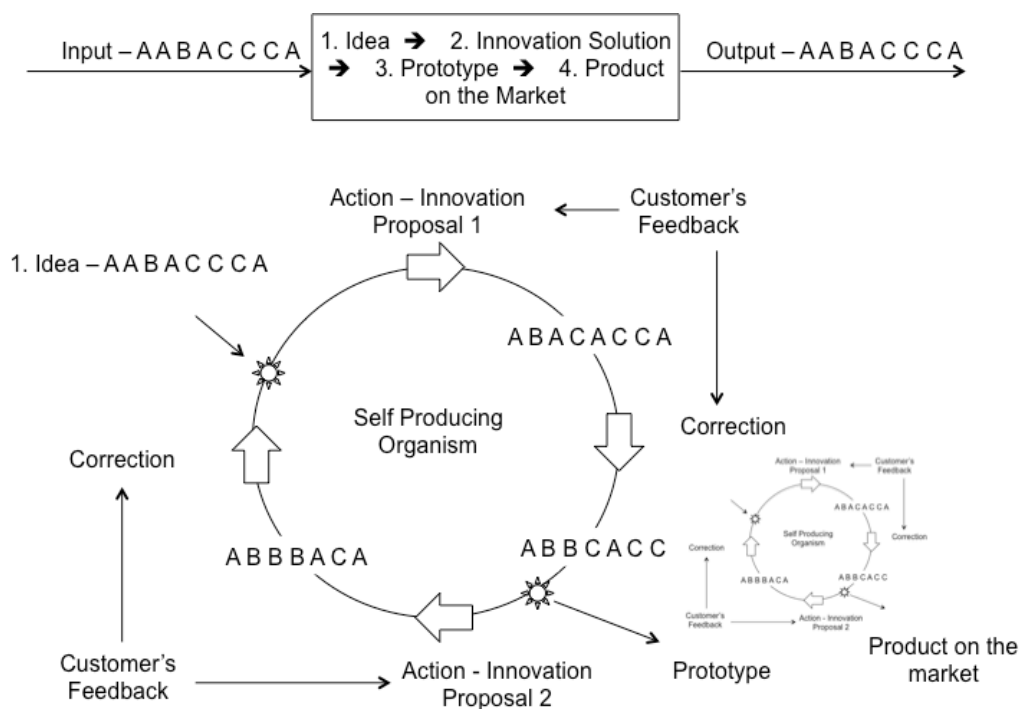


Fig.4. Traditional linear, mechanical product innovation process versus iterative living innovation organisation

- In the last 5 years the companies are increasing their focus on the development of human potential in the corporation. They invest more attention into development of knowledge and talents, improving four human potentials (physical, intellectual, emotional and moral) and motivation factors as – freedom and autonomy, mastery and purpose.

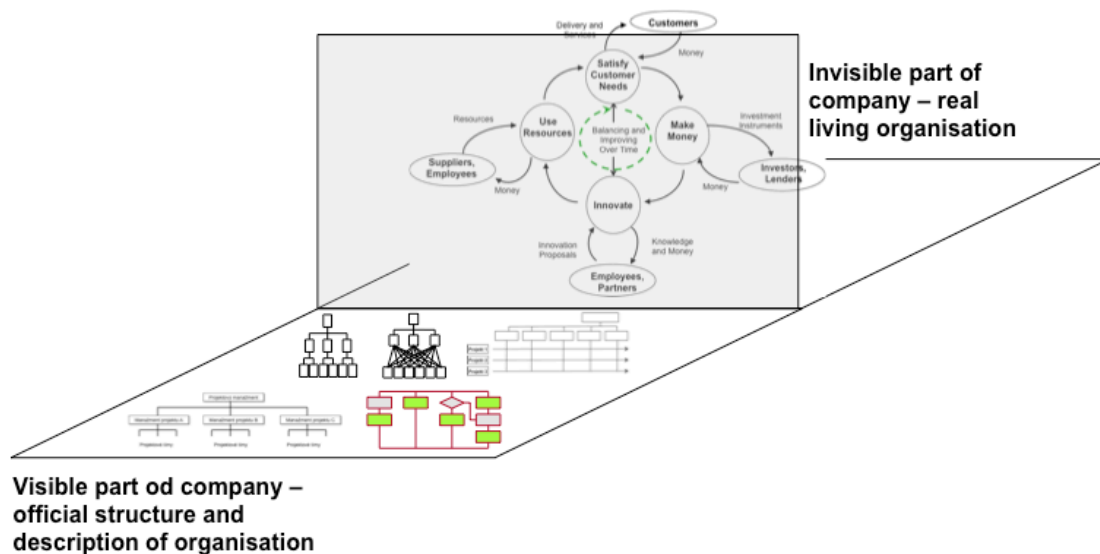


Fig.5. Visible and invisible part of each company

All systems contain contradictions - something gets worse as something gets better (e.g. strength versus weight). Traditional approach usually accepts a compromise or a trade-off, but this is often not necessary. Powerful, breakthrough solutions are the ones that don't accept the trade-offs. Such solutions are actively focused on contradictions and they are looking for ways of eliminating the compromise.

**Benchmarking, Competition,
Follow up Others, „Red Ocean“**

**...Breakthrough Innovations,
Business Leadership, „Blue Ocean“**

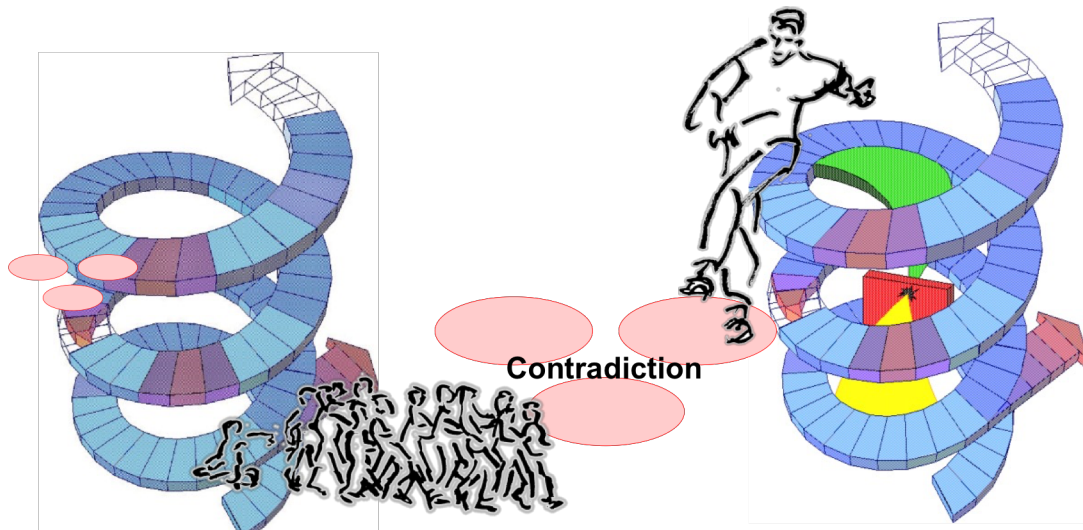


Fig.6.: Overcoming tradeoffs through contradictions (Linde)

Traditional performance improvement methods – current and future state

Many industrial areas, as well as management paradigms, have been changed in the last, recent 30 years. Mass customization, global value stream networks, accelerated innovation and product development cycles, new business models, new competitive factors. What are the influences of this development on the traditional discipline Industrial Engineering? What are the new requirements on Industrial Engineers in a flat world? Where are the new challenges and paradigms for Industrial Engineering?

The definition of Industrial Engineering says: „Industrial engineers design and improve work systems. These systems include people, equipment, materials, information, energy, and money“.

Industrial Engineering was developed in the 20th. century in USA, Europe and Japan with some regional differences (Fig.7.). For the European school of Industrial Engineering, a strong technical background of mechanical engineering is typical, production engineering as well as a detailed focus on time measurement, cost and capacity calculation. For the implementation of IE methods in many European companies the acceptance of the trade unions is necessary (e.g. REFA is well-accepted by trade unions in Germany).

The typical REFA Industrial Engineer has the following qualification:

1. Basics of organisation development – Management practice and leadership psychology, project management, personnel and work management (economy)

2. Costs and performance calculation, productivity controlling, business process development, total corporate management
3. Practical skills – project and engineering practice

The American school of Industrial Engineering has strong roots in statistical methods in quality, mathematics and optimisation methods of operation research, simulation but also the methods for work analysis and facilities layout planning. The base of the methods of the Japanese school of Industrial Engineering is the Toyota Production System oriented on waste elimination in the entire value stream. But also Japanese universities and companies incorporated simulation, mathematics and operation research programmes into the traditional „common sense“ Industrial Engineering methods. Toyota's former President Katsuaki Watanabe emphasizes the importance of combining continuous improvement (Kaizen) with radical innovations (Kakushin).

The globalisation wave in previous decades also influences Industrial Engineering. The American, European and Japanese schools of Industrial Engineering are integrated. The traditional focus of Industrial Engineering is on process analysis and improvement. The new orientation of this discipline has to accent more on customer orientation (not only waste elimination but more systematic customer value creation - innovation) and also the human aspect as the most important factor of flexibility, productivity and creativity.

The trend in industrial engineering is towards interdisciplinary courses where cross-speciality thinking is practised. Information technology is being increasingly integrated into IE courses and alongside the basic subjects that deal with hard facts, there are more and more classes looking at issues of teamwork, people motivation, communication skills, emotional intelligence and ethics.

	USA	Europe	Japan
Focus of Industrial Engineering	Systems Optimization, Statistical Process Control, Simulation, Bottleneck Management, Project Management	Complex process optimization, CIM, CAD/CAM, Flexible Automation, Systems Engineering, Digital Factory	Waste Elimination, Simplification, Visualization, Low Cost Automation, Common Sense, Lean, TPS, Kaizen
Typical Role of the Industrial Engineer	Systems Integrator, Optimizer, Process Improvement and re-engineering	Production Process Optimization,	Lean Manager, Teacher, Trainer,
Who are the Industrial Engineers?	Industrial Engineering Department, Operation Management	Department of Work and Process Organization, Production Planning Department	Hancho – Supervisor on Shop Floor, Every Employee from CEO to the Worker on the Line has some IE Skills
Typical Concepts and Methods in Industrial Engineering	Operation Research, Simulation, Six Sigma, TOC	Work Measurement, Capacity Calculation, Layout Planning, Process Management	Lean Thinking
Leading	Institute of Industrial Engineers, Maynard's, Lean	REFA, MTM, Fraunhofer	Toyota, Nissan, Omron

Influence	Institute, MIT, Purdue University, Goldratt Institute		
Some IE Leaders	Babbage Towne, Hasley, Gantt, Taylor, Gillbreth, Ford, Deming, Shewhart, Pritsker, White, Malcom	Fayol, Mitrofanov, Altschuller, Schumpeter, T.Bat'a, J.Bat'a, Warnecke	Toyoda, Suzaki, Imai, Takeda, Shingo, Ishikawa, Taguchi, Ohno, Monden

Fig. 7. Development of Industrial Engineering in Different Countries

	Yesterday	Tomorrow
Corporate strategy focus	Productivity, FMS, Lean Six Sigma, TQM, TOC	Continuous Customer Value Creation, Innovation, Learning Company
Corporate processes	Improvement and Standardization	Improvement and Innovation
Change management focus	Best practices, benchmarking, imitation of the world class strategies, increase of customer value	New Practices – Blue Ocean, create new or different customer value
Employees	Focus on the “employee’s muscles” (performance – physical intelligence) and brains (kaizen – mental intelligence)	Focus on the employee’s heart (self motivation, emotional intelligence) and soul (moral and ethics – soul intelligence)
Competitive factors	Hardware, software, technology	Peopleware, Brainware, co-ware, knowledge
Corporate culture	No mistake and error culture	Culture of trials and experiments
Intercorporate relationships	Competition, fight	Co-operation, partnership
Management philosophy	Trade Off Thinking - High Quality OR Low Cost, Affordable OR Customized	Breakthrough Thinking, High Quality AND Low Cost, Affordable AND Customized
Management focus	Quality, Productivity, Flexibility	Innovation and Knowledge Management
Improvement Concepts	Lean Manufacturing, Six Sigma, TOC	Systematic Innovation, Lean Product Development
Innovation focus	Product and Process innovation	Business System and Thinking Innovation
Management principles	Management by objectives, process and project management	Management by opportunities, company as a living organism

Fig. 8. New paradigms influencing further development of Industrial Engineering in recent years

The difference between an excellent and a good company is not in the machines, the software or the organisational structure. The difference is in the co-ware – co-operation, creation and dissemination of knowledge through the company.

What is the new roles of industrial engineering in a new world?

1. The industrial engineer will still focus on value stream improvement, but not only in manufacturing. Administrative, product development, customer service and logistical processes offer huge improvement potential.
2. The integration of traditional concepts for process improvement like Lean, Six Sigma and TOC. These concepts for waste elimination, reduction of process variation and throughput increase will be combined with concepts for customer value creation.
3. Today, the typical job position of industrial engineers is in the production and logistics departments. In the future, the industrial engineers will penetrate into the departments for product and process development and innovation management, where the higher opportunities to reduce costs, eliminate waste and improve quality rather than production are.
4. Industrial engineers have to increase their orientation on the people. Not only in the traditional sense – ergonomics, but also in the areas of emotional intelligence, co-operation, knowledge management, coaching, training, leadership, communication, etc. The companies should be able to solve the following important questions regarding knowledge management: How to reach and keep the best talents and individuals? How to share, communicate and develop the best corporate practices in the organisation? How to transfer knowledge between employees on the projects and actions in the company? How to increase and measure knowledge? How to change knowledge into innovation as fast as possible?
5. The design and development of teamwork in the entire company – this is the crucial competence of industrial engineers for the future. Not only the classical autonomous teams in production or logistics oriented on performance and productivity, but also the creative teams of strong individuals, focused on innovation ability, will be important. The other important task is to build multi-cultural teams in the global production networks.
6. Work analysis and measurement is the traditional competence of industrial engineers. New opportunities for this discipline are in logistics, distribution, office, and product and process development.
7. Industrial engineers will penetrate from production departments to other company areas. There are many new application fields for traditional IE methods – e.g. 5S in information systems, simulation and value stream management of supply chain networks, simplification and streamlining of management processes – waste in meetings, reporting, etc.

New approach for corporate performance improvement

After many years of streamlining of the business and manufacturing processes many managers are now asking how to increase the competitiveness of their companies. Many cost reduction strategies led in many cases only to a temporary success. The previous problems are back and the improvement potential is decreasing. Like the Yo-Yo effect in a slimming programme. New buzzwords, medical cures, healers and medicines are coming. BPR, BSC, Lean, Six Sigma, TOC, and other new miraculous

methods are applied. Sometimes successfully, sometimes not. A new wave is coming in recent years – innovations and knowledge management.

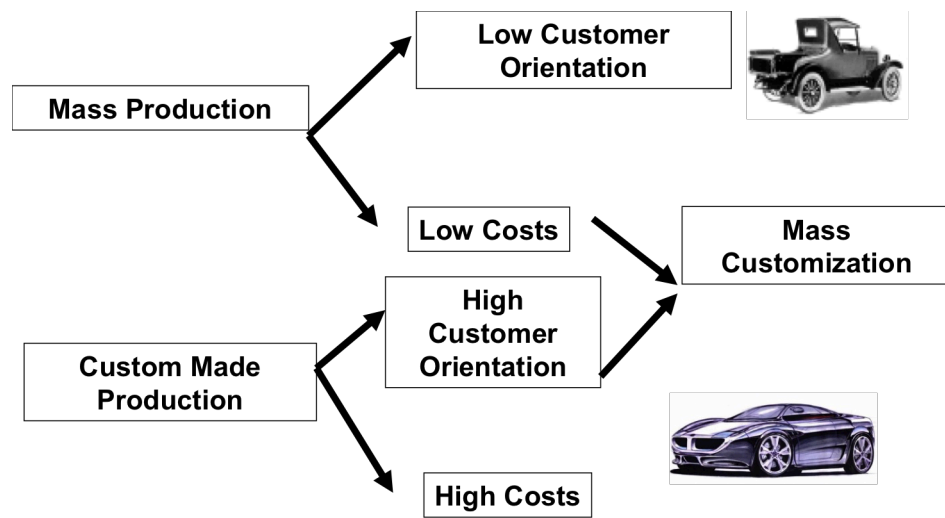


Fig.9.: Mass Customization – the engine of business development in the recent years

Many companies are oriented on low cost strategies. But some cost attack programmes and transfer production facilities to the low cost countries showed that it is not the right and strategic solution. In the recent years many West European and US manufacturing firms have moved their production plants to the low cost countries. Over time, they recognized that they had lost some competitive advantages because some departments were physically separated (e.g. product design, production engineering, production, logistics) and the communication and co-operation between them was limited. Also many cultural differences reduced the effects of the low cost location. Not even massive implementation of lean management, Six Sigma or other world class concepts bring sometimes any radical improvement. Company success is not only in optimization of current processes (doing right things right) but first of all in innovation (looking for new – but as fast as possible). The productivity world will be replaced by the world of creativity, the world of the perfect planning will be replaced by the world of the experiments and generating new ideas and opportunities. Not perfect planning of the change but fast realization of the change is the way towards success.

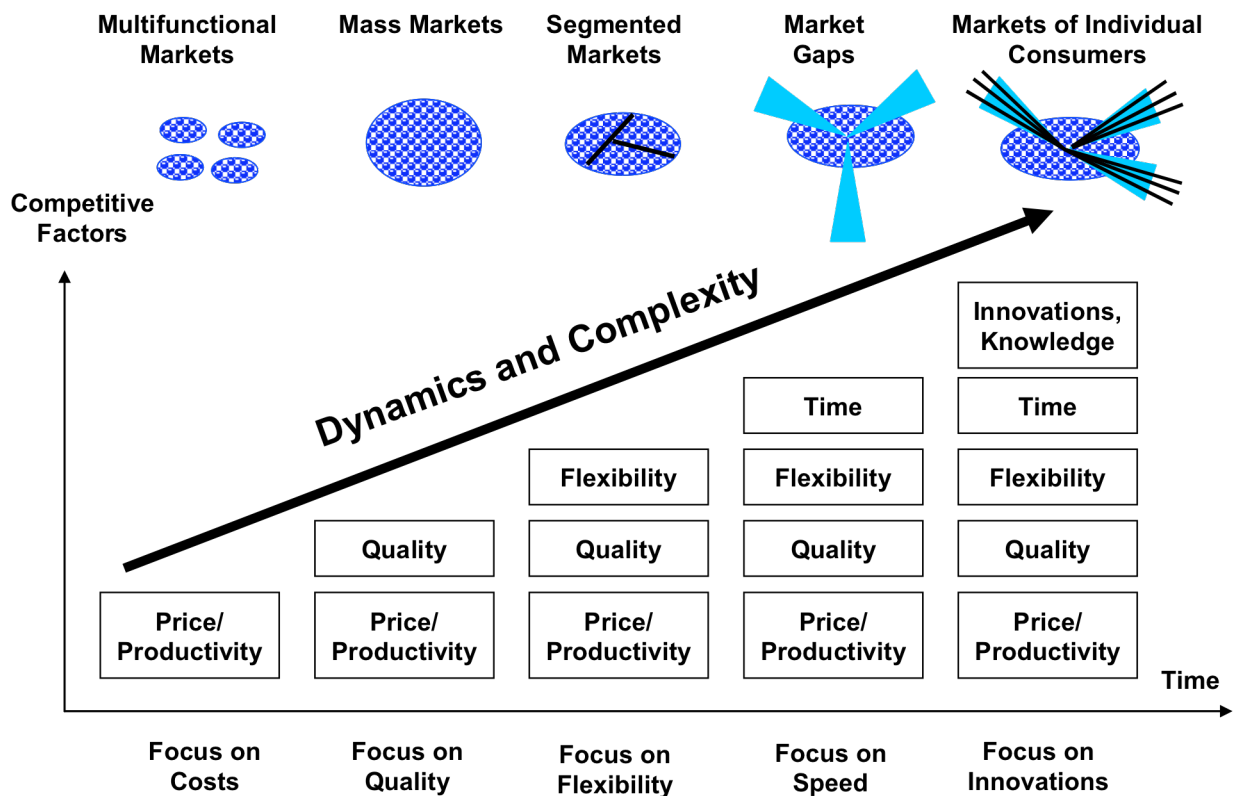


Fig.10.: Changing of markets and competitive factors

The father's world of the business has been changed radically in the recent years. The old world of compromises (e.g. quality OR price, customization OR delivery time) has been replaced by the new world where the tradeoffs are not accepted. When you have two options – take both! This is the new rule of success on the market.

Customer value distinguishes the innovation from the simple change. But the innovation is not to be only a breakthrough technical solution. Generation of technical changes on the product or technological advantage in the production process have not necessarily led to success. Many companies have a perfect product, produced by an excellent technology. They have the only limitation – the customers don't buy them, because they don't see any reason to buy them. They did not find the customer value. Innovation must generate "something new" for the customer life – simplification, risk elimination, convenience, better price, fun, image and emotions, style or environmental friendliness.

D.Mann defines two ways of thinking regarding innovations:

Trade-Off Thinking	Breakthrough Thinking
High Quality OR Low Cost	High Quality AND Low Cost
Affordable OR Customized	Affordable AND Customized
First Cost OR Life Cycle Cost	First Cost AND Life Cycle Cost
Flexible OR Rigid	Flexible AND Rigid
Big OR Small	Big AND Small
Adaptor OR Innovator	Adaptor AND Innovator
A OR B	A AND B

The WOIS approach developed by H.Linde has been successfully used in breakthrough product, process and business innovations in many companies (e.g. BMW, Braun, Hilti, Viking, etc.).

The main elements of the WOIS innovation methodology are:

1. Definition of the strategic orientation
2. Definition of contradictions. Answers to the questions -What and Why?
3. Solution of contradiction (46 innovation principles, technical and physical contradiction, solution maps, laws of evolution, bionics). Answers on the questions – How?
4. Concurrent innovations in product, processes, organization, resources and marketing.
5. Implementation and evaluation

The basic conditions and principles of successful innovation using WOIS are:

- The innovation project starts with deep analyses - market analysis, product trends, analysis of technological trends, process analysis, analysis of production and assembly trends, trends in sales and service systems, analysis of the product as a system and its environment, analysis of system functions, analysis of existing solutions (patents, competitive solutions, solutions of other areas, generation of solution maps, benchmarking), analysis of system generations and evolution.
- Integrated, team based design and development process – marketing concept, product and process are designed by the same multifunctional team (marketing, design, process planning, production, logistics, controlling, customer).
- Use of the knowledge of the system evolution and system generations – strong orientation on the past and future development trends. Not only a new products or processes are created, but also the knowledge and strong learning effect is generated through the innovation process.

- Culture of creativity, acceptance of failures, space for experiments, prototypes, testing new ideas.

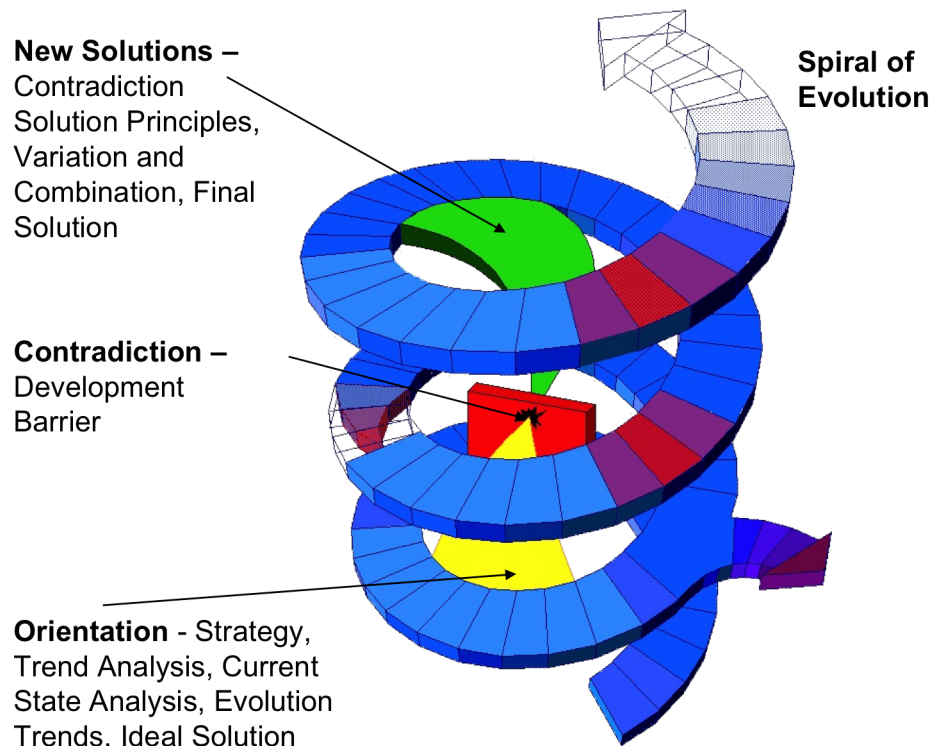


Fig.11.: Contradiction based innovation strategy WOIS (Linde)

Knowledge Management and Corporate Potentials

Innovation adds value through knowledge. The knowledge management is a set of processes, policies, and tools that link knowledge of employees to new sources of value (products, services, processes) in order to create innovative solutions.

Some stakeholders and managers are focused only on the results, not on the analysis and systematic measurement and improvement of the corporate potentials. The biggest competitive advantage is not saved in the manufacturing or information technologies, but in the ability to manage the company potentials in four areas:

1. Mental – corporate strategy
2. Physical – processes and resources
3. Emotional – people development and knowledge management
4. Spiritual – corporate culture

Each company has two basic functions:

1. Production and development products and services – this is the prerequisite for earning money, making profit and growing company.

2. Self reproduction - creating knowledge and development of people – this is the prerequisite for long term mastering of the function 1.

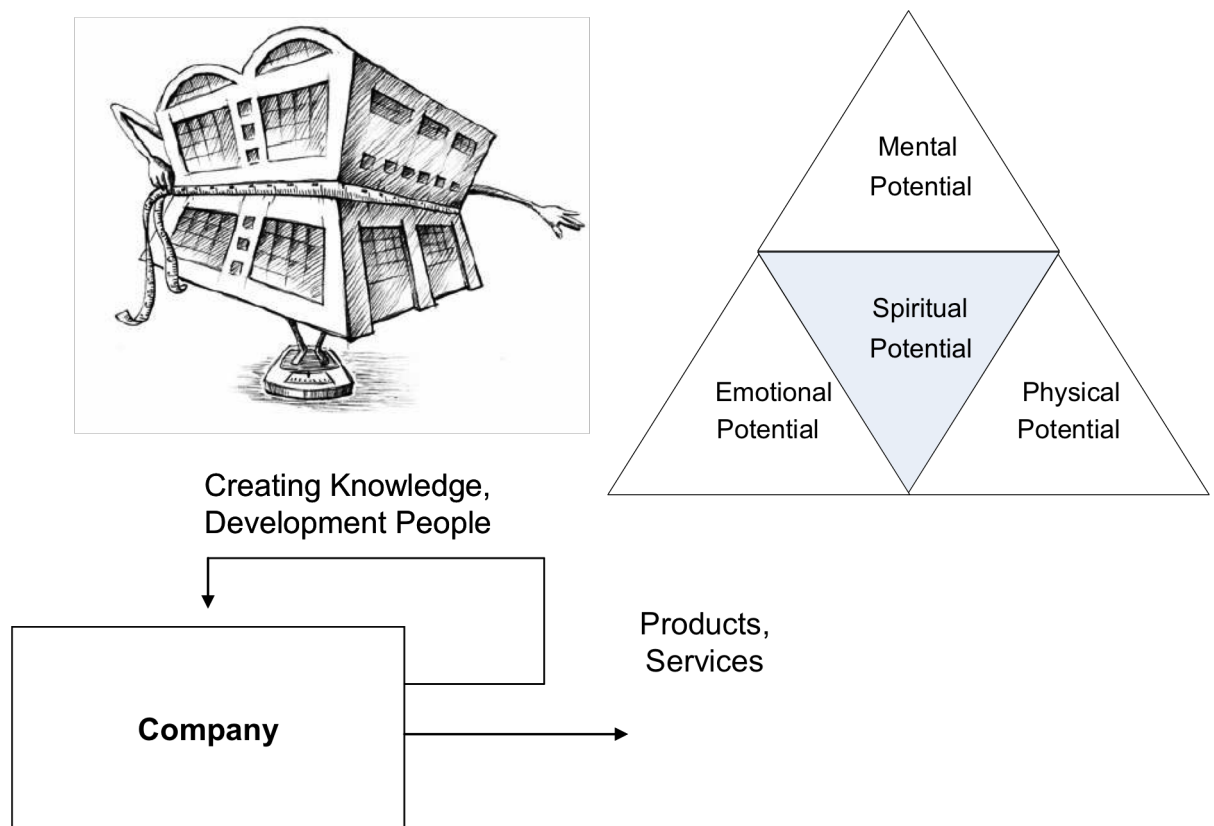


Fig. 12. Two functions and four potentials in a company

The difference between an excellent and a good company is not in the machines, the software or the organisational structure. The difference is in the co-ware – co-operation, creation and dissemination of knowledge through the company (Fig.13.).

The companies should be able to solve the following important questions regarding the knowledge management:

1. How to reach and keep the best talents and individuals?
2. How to share, communicate and develop the best corporate practices in the organisation?
3. How to transfer knowledge between employees on the projects and actions in the company?
4. How to increase and measure knowledge?
5. How to change knowledge into innovation as fast as possible?

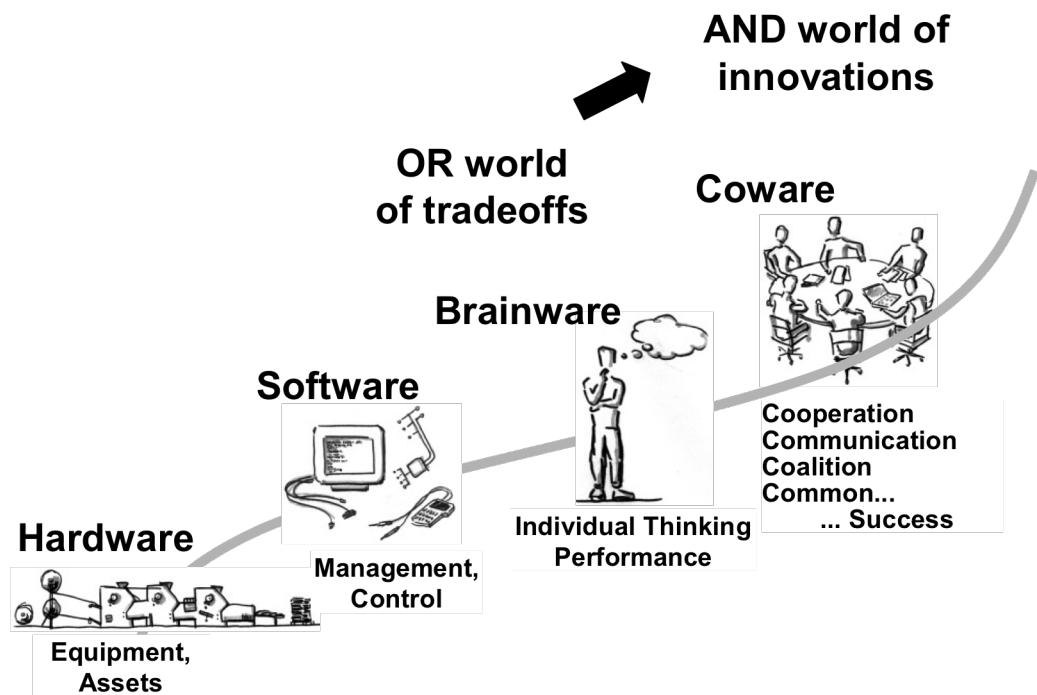


Fig. 13. New competitive factors in an innovation age (Linde)

Conclusion

There are some new paradigms on the beginning of the new world of business. Companies which will be able to use these opportunities will have a higher chance to survive.

	Yesterday	Tomorrow
Corporate strategy	Productivity	Innovation
Corporate processes	Standardization	Improvement
Change management focus	Best practices, benchmarking, increase customer value	New Practices – Blue Ocean, create new customer value
Employees	Focus on the “employee’s muscles” (performance – physical intelligence) and brains (kaizen – mental intelligence)	Focus on the employee’s heart (self motivation, emotional intelligence) and soul (moral and ethics – soul intelligence)
Competitive factors	Hardware, software	Brainware, co-ware
Corporate culture	No mistake and error culture	Culture of trials and experiments
Intercompany relationships	Competition, fight	Co-operation, partnership

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