



Politechnika Wroclawska

*How to teach the engineers for
the (social) market economy*

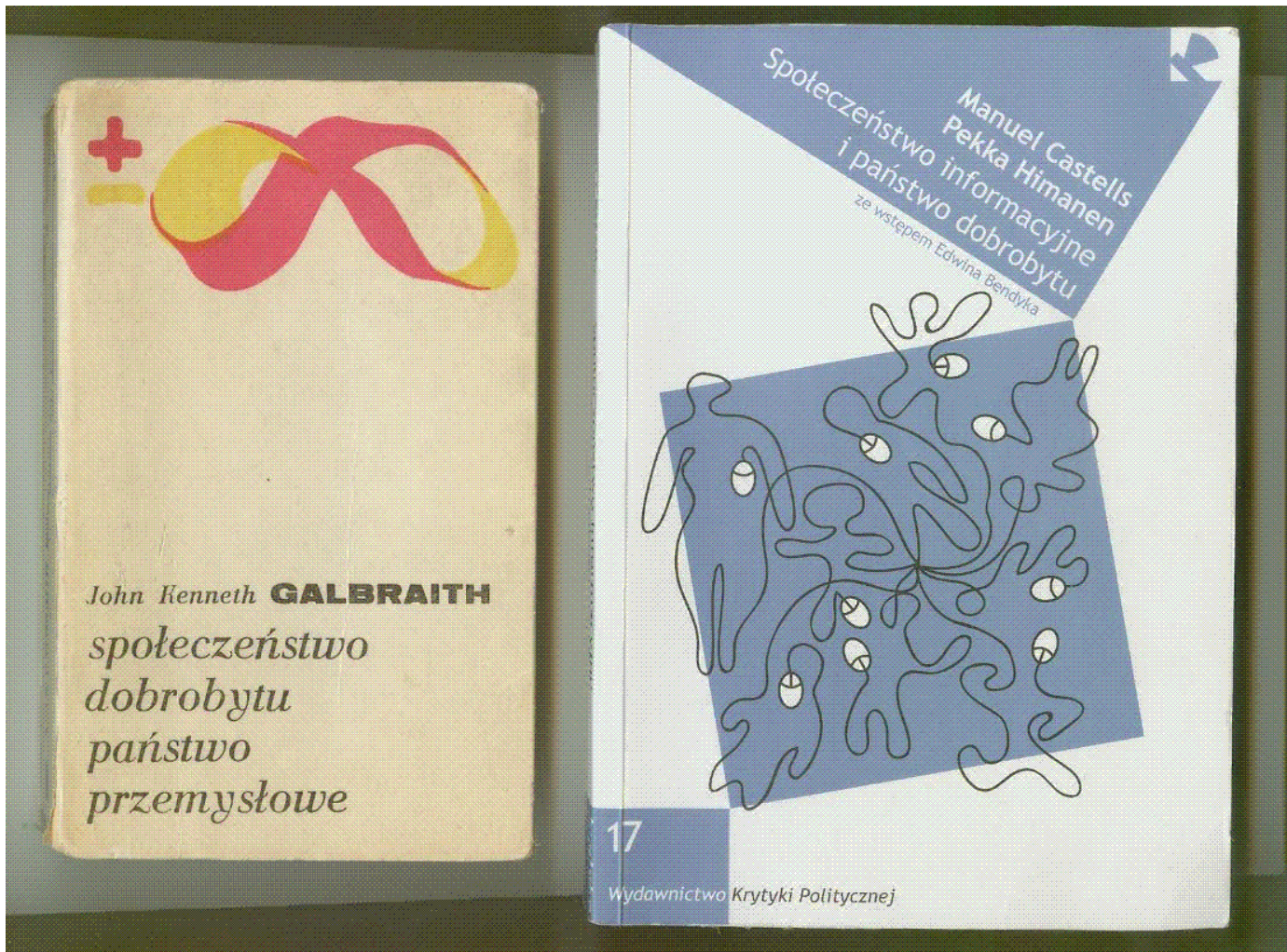
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Koblenz

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How to build the organization of welfare? (industrial organization or information organization?)





Contemporary forces the shaping future of organizations

(E.Bendyk, Punkt Przełomu, 2012)

- Transfer of economic and political "equilibrium" to the east: China, India, new consumption, distribute technologies(e.g.Jugaad innovation, smart innovation), patent wars (ACTA), informal economy;
- Paradigm of the productivity, automation, cloudy technologies, Big Data;
- Global network, internet, platforms of exchange of knowledge, Wikipedia;
- Limited access to raw materials, circulation economy, protection of the Earth, possession of properties loses on a value;
- Relation state-market: erosion of the democratic state, crisis of trust, limitation of civil laws, limited access to basic properties;



From mass production to mass creativity - Dominating Roles of Engineers

PHASE OF DEVELOPMENT	NATURE OF THE MARKET	NATURE OF COMPETITION	DOMINATING ROLES OF ENGINEERS
Age of individual entrepreneurship until 1900	Exceptionally receptive, but with poorly stimulated needs. Stimulated needs on the basis of inventions from the 19th century.	"Predatory" competition, aiming more at domination or stealing the competitor rather than at direct meeting on the market.	Engineer inventor
Age of mass production 1900-1930	Receptive and hardly discriminating market with regard to the diversity in the utility parameters of products and services. Pursuit of the satisfaction of basic needs	Boundaries of industrial activities are clearly identified. The winner is the one who offers the product for a lower price (production line). Pursuit of achieving the benefits of a large production scale (Economics of Scale).	Engineer specialist, inventor



Age of mass marketing 1930-1960	Demand close to saturation. Customers demand the satisfaction of more sophisticated needs. Market segmentation appears.	The emergence of sales focus. Growth in the importance of distribution, market research, promotion and advertising.	Engineer designer-salesman, specialist, inventor
Age of mass customization 1960-2000	The emergence of wealth on the market. Customers demand diverse products, even within specific market segments.	Cost competition loses significance for the benefit of capacity and the speed of adjustment to changes on the market (operational flexibility). Focus on the economics of a group of goods (Economics of Scope). Growth in the importance of symbols, brands, signs.	Engineer manager, specialist, salesman innovator, stylist



<p>Age of mass creativity from 2000</p>	<p>Development of economy on knowledge and creativity. Development of smart products. Socially responsible company. Protection of intellectual property.</p>	<p>Turbulent changes in the environment. The competition moves to the area of innovations and skills, creating new market niches and their deep penetration. Competition - winner takes all. Global, glocal and local strategies.</p>	<p>Engineer manager, specialist, salesman, innovator, stylist, entrepreneur, creator</p>
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Creative workshop as an instrument for engineers' education at the Wroclaw University of Technology

The problem of engineers' education in the field of entrepreneurship is truly complex, requiring introduction of practical elements linked with theoretical issues.



- ❑ Experience-based teaching methods are crucial for developing entrepreneurial skills and capabilities. Traditional teaching methods (e.g. lectures) do not match entrepreneurial thinking development. Approaches involving more interactive teaching (workshops, laboratories projects, interactive games), with the teacher being a moderator rather than a traditional lecturer, are demanded. Entrepreneurial skills rely mainly on crossing boundaries between disciplines, multi-disciplinary cooperation and collaboration with entrepreneurs.



- ❑ The first attempts of the WUT in this respect are highly satisfactory, due to the achieved results and benefits. (i.e. regional project "Shaping creative market attitudes in engineer education in the years 2010-2011"). Entrepreneurship knowledge is demanded among students. We believe that an effective solution to this problem is launching, for all WUT students, a creative workshop for shaping innovative, entrepreneurial and social competences, attitudes and behaviours.



□ Therefore, we offer introducing creative workshops to the engineers' education system. We treat them (workshops) as a space for shaping innovative, entrepreneurial and social competences, attitudes and behaviours among students.



Field of Study (Subject): Management Engineering

- FACULTY OF THE COMPUTER SCIENCE AND THE MANAGEMENT
- Field of Study (Subject): Management Engineering
- Specialization: IT Applying in the business
- Full-time studies (7 semesters) of the first degree, Wrocław Poland



Semester I

- Mathematical analysis
- Databases
- The economy
- Pragmatic logician for the engineers
- Law for the engineers
- Information technology
- The theory of the organization and of the administration



Semester II

- Technical physicist of working environment
- Data warehouses
- Protection of intellectual property
- The account of probability
- The regulations of economic activities
- Internet technology
- Introduction to the optimalization
- Organizational behaviors



Semester III

- Statistics for engineers
- Analysis of the systems and engineering of the systems
- Grounds of engineering invention
- Programming of applique
- Account and finances for engineers
- Management by products and logistic
- Public competences
- Sport



Semester IV

- ❑ Engineering of decision are operating Researches
- ❑ Techniques of these researches
- ❑ Economic analysis of business decisions
- ❑ Analysis of processes of informative organizations
- ❑ Innovations and engineering entrepreneurship
- ❑ Marketing
- ❑ Basic of management by a project
- ❑ PRACTICE
- ❑ Foreign Language B2.1



Semester V

- ❑ Analysis and classification of data
- ❑ Instruments of informatics, helping a decision-making
- ❑ Application of methods of the engineering planning of control system
- ❑ Management methodologies by a project
- ❑ Design of business processes
- ❑ Systems managements of informatics
- ❑ Quality Management
- ❑ Foreign Language B2.2



Semester VI

- ❑ Simulation and prognostication in engineering of management
- ❑ Planning of business analyzers
- ❑ Analytical systems
- ❑ Analysis planning and Implementation of business processes
- ❑ Instruments of management informatics by projects
- ❑ Diploma seminar
- ❑ Management by human supplies
- ❑ Public competences of II



Semester VII

- Design of work place
- Controlling of project
- E-economy
- Engineering work
- Feasibility study of infrastructural projects
- Leading training
- Management by the processes of informatization
- Engineering project workshops



**Thank you
for attention!**

Jan Skonieczny

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