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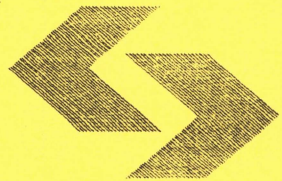
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Break point strategies  
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# **Educational Process Reengineering and the Future of the Digital Economy. Break Point Strategies for Systemic Dominance**

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## **Abstract**

The long-term perspectives on mankind's economic past, present and future were, are and will be based on education. The first the agricultural revolution was based on handwriting and dispersal systems of schools, the second the industrial revolution was based on industrial printing and hierarchical systems of schools and universities as well as mass production of educated personnel for industry and state, the third the information revolution will be based on the new educational revolution – the coming digitization of National Educational Sectors.

It's now clear that the Polish education sector is in greater trouble than was generally realized when the current Polish transition started in 1989.

The catastrophic situation of the Polish education is due to many reasons, local, regional and national ones.

Nevertheless, the Polish education sector is still at the point of no return – no return to old but well established industrial education style of the so-called industrial society.

Current, so-called “New educational reform” in Poland is from the systems analysis point of view still old-fashioned one because will not produce high talent personnel for digital economics and information societies in Poland and Europe.

The new educational systemic revolution in Poland is needed now, based on full digitization of whole educational sector ready for mass production of high talent personnel by systems integrated and collaborative networks of state and private schools and universities.

## **1.Introduction**

It is now clear that the Polish education sector is in greater trouble than was generally realized when the current Polish economical, political and social transition started in 1989. The catastrophic situation of the Polish education is due to many reasons, local, regional, national and supranational as global ones.

Nevertheless, the Polish education is still at the point of no return – no return to old education style of the so-called industrial society as well as.

The ideas for the paper came out of series of research projects of Systems Research Institute of the Polish Academy of Sciences and Applied Informatics and Management University. Warsaw. SRI and AIMU projects on modeling and analyzing economy and society in transition, new digital economy, new management, new education and new technology started since 1989. One of projects was directly committed with the concept of reengineering of the Polish education started as early as 1994.

## **2. The New Great Transition**

A long-term perspective on mankind's economic and social past, present and future includes three great transitions. The first was the agricultural revolution transition that occurred some ten thousand years ago and essentially created civic culture. Man ceased to be a wandering nomad and created communities tied to a particular area of land. The agricultural revolution transition took eight thousand years to spread around the world

The second great transition began two hundred years ago and was based on Energy and Industrial Revolution and after one hundred years also Managerial Revolution. Two hundred years was too short to spread the second great transition around the world. Even in some European countries like Poland the second transition was not completed yet, especially in such sector of economy like agriculture.

The third great transition began, in 1989, when Tim Burners-Lee invented the World

Wide Web technology. He put forward a “global hypertext project” to allow people to share their work around the world. Work could be now widespread over the globe instantly. Today about ten percent of human population use already this first literally and technologically global system. By 2010 the WWW technology could be reachable for more than fifty percent of global human population. The WWW is the first but not least global technology, however we could consider now that Information Revolution occurred at the last moment of the 20<sup>th</sup> century and that 21<sup>st</sup> century belongs fully to New Third Great Transition. It is true for all sectors of economy and society, including of course education.



### **3.A Few Rules for Any Sector of Economy within Information Society.**

The economy for the Information Society is a digital economy. In the old economy, information flow was physical: cash, checks, invoices, bills of landing, reports, face to face meeting, analog telephone calls or radio and television transmissions, blueprints, maps, photographs, musical scores, and direct mail advertisement.

In the new economy for the Information Society, information in all forms becomes digital. The new economy is also knowledge and research economy based on the application of human knowledge and research results to everything we produce and how we produce it. In the new economy, more and more of the economy's added value will be produced by knowledge workers, researchers and manager's brain. Many agricultural and industrial jobs are already knowledge workers and in American economy nine of ten new jobs are in information-intensive sectors of the economy.

In the new digital economy, adding ideas to products and turning new ideas into new products is what the future is all about. Whether people as consumers or producers, adding ideas will be central to wealth creation in the new economy. The Information Society is based on the Networked Intelligence, silicon microprocessors and roads of glass fiber are enabling humans across the hall, across the region and across the planet to apply their know-how, knowledge and wisdom to every aspect of production and economic life. This is an age of networking not only of technology but humans, organizations and societies, creating world wide web of human and artificial intelligence.

In the digital economy, competition doesn't come from competitors only – it comes from everywhere; and collaboration doesn't come from aliens only – it could come from competitors too. The new enterprise is a network of distributed teams based on the application of C<sup>4</sup>I<sup>3</sup> technology – command, control, communications, computing / information, intelligence and intellect technologies. A few overlapping rules are emerging that differentiate the new (digital) economy from the old.

#### **RULE 1: KNOWLEDGE AND RESEARCH**

- The new (digital) economy is a knowledge and R&D – intensive economy.

Information, intelligence and intellect technology (I<sup>3</sup>T) enables an economy based on knowledge, intellect and wisdom. The new era of smart products including machines, robots, houses, factories and so on will revolutionize every aspect of economy and society.

#### **RULE 2: DIGITIZATION**

- The 21<sup>st</sup> century economy is a digital economy

In the new economy, information, intelligence and intellect are in digital form: bits. When information, intelligence and intellect become digitized and communicated through digital networks as well as stored in bits, a new world of possibilities unfolds. New digital appliances can be created very soon that fit in your pocket and can have access to world wide vast information and knowledge bases wide.

### RULE 3: VIRTUALIZATION / MOLECULARIZATION

In the new (digital) economy, there are a lot of virtual matters:

- Virtual corporation
- Virtual agency
- Virtual market
- Virtual schools
- Virtual university
- Virtual teams and so on

The new (digital) economy is a molecular as well as virtual economy. The large corporation is being disaggregated, replaced by molecules and others entities that form the dynamic basis of economic activity.

### RULE 4: SYSTEMS INTEGRATION / INTERNETWORKING

- The new (digital) economy is a networking economy, systems integrating molecules into new clusters that network with others for the creation of wealth.

The C<sup>4</sup>I<sup>3</sup> technology networks enable small companies to overcome the main advantages of big companies – economies of scale and access to resources. The Internetworked Enterprise will be a far-reaching extension of the virtual corporation and dot.com because there will be access to external business relationships and a dramatic increase in outsourcing. The Internetworked Enterprise will behave like Internet, where everyone can participate and based on systems synergy, where the total effort is greater than the sum of the parts. Networks of networks along the Internet model are beginning to break down walls among companies – suppliers, customers and competitors. Every

economy needs a national C4I3 infrastructure. The new infrastructure will change economic activity as thousand folds or more, as did electrification.

#### RULE 5: DISINTERMEDIATION / CONVERGENCE

The new national C<sup>4</sup>I<sup>3</sup> infrastructure will change dramatically the role of middleman functions in new (digital) economy, partly eliminating them, partly offering them a new role. The C<sup>4</sup>I<sup>3</sup> technology it is a convergence technology itself and will stimulate other convergence trends in new (digital) economy. Convergence is becoming the basis of all sectors of new (digital) economy.

#### RULE 6: PROSUMPTION / IMMEDIACY

In the new (digital) economy mass production is replaced by mass customization, producers must create specific products that reflect the requirements and tastes of individual consumers. In the new digital economy, consumers become involved in the actual production process. The new (digital) enterprise is a real time enterprise, which is continuously and immediately adjusting to changing business conditions through information immediacy. The recent RAND concept of “velocity management” will contribute to the new (digital) economy.

#### RULE 7: GLOBALIZATION

In the new (digital) economy is a global economy from the very, very beginning. Contrary to popular wisdom, companies from the fringes of the world economy can become global players. What they need is organizational confidence, a clear strategy, a passion for learning and the leadership to bring these factors together.

Is there a New Economy? Will the New Economy survive both the collapse of New Economy stocks and the cyclical downturn? Is a New Economy, a new (digital) economy described above?

A New Economy it was a name for 1995-2000 dot-com companies subeconomy. In the past year NASDAQ prices of the dot-com companies have fallen with astonishing speed, wiping out more than half of the previous five years gaining. Never has so much wealth created or destroyed so fast. However, financial markets are not a reliable indicator of the economic benefits of great technological revolution. Many economists continue to believe, that improvements in information technology have already increased the efficiency and productivity of the U.S. economy, with additional benefits to come as both old and new companies adapt their operation to make the most of the new technologies.



#### **4. The woeful lack of analysis in Polish government and management – the reengineering revolution within Polish sector of education is needed.**

When Polish governments and managers are forming policy, do they first study the facts and figures relating to the area in question? As a rule, no. Do they define their objectives? As a rule, no. How about assessing the likely impact? You guessed! It could explain an awful lot, couldn't it?

The fundamental rethinking and radical redesign of educational process to bring about improvements in performance at all schools and universities is necessary – the reengineering revolution within Polish sector of education is needed.

There are four key words in the reengineering concept. Let's start near the end, with the concept of "dramatic" improvement. Reengineering is not about making marginal improvements to education. It is not about making education performance 5 percent or 10 percent better. It is about making quantum leaps in performance, achieving breakthroughs.

The second key word is "radical". Radical means going to the roots of educational process. Reengineering is not about improving what already exists. Rather, it is about throwing it away and starting over. Some may find this notion extreme, even dangerous.

The third key word is the definition of "educational process". By a process, we mean a group of related tasks that together create educational value for a person.

The fourth key word in the definition is "redesign". Reengineering is about the design of how education is done. Reengineering is based on the premise that the design of process how education is done – is of essential importance.

What reengineering is not? There are many widespread misconceptions about the nature of reengineering. Reengineering is not downsizing. Downsizing means getting rid of people and jobs to improve short-term financial results. Reengineering is about rethinking education from the ground up in order to eliminate education that is not necessary and to find better ways of doing education that is. Reengineering eliminates bad education, not jobs or people.

Reengineering is also not "restructuring" usually an euphemism for moving boxes around on educational chart. Reengineering is centered on how education is done, not how schools and universities are structured.

#### **5. Systems Integrated Organized Technology for Twenty First Century Education Sector.**

The interrelation between people's values, desires, lifestyles, institutions, environment and technology have been crucial for education development in the 19<sup>th</sup> and 20<sup>th</sup> centuries. In the 21<sup>st</sup> century "the wired world and the networked global society" as a whole, along with the set of networks

of interrelated regions will be based on systems integrated organized technology (SIOT). The concept of the *systems integrated organized technology* was developed at IIASA by Dobrov, McManus and Straszak (1979). The SIOT is a three-dimensional construct, which includes hardware, software and orgware dimensions, or – technology hardware, technology intelligence and technology organizational ability dimensions. SIOT means technology integrated with users' intelligence. Educational development in the 21<sup>st</sup> century will need technology integrated into the educational development process, see Fig. 1.,2

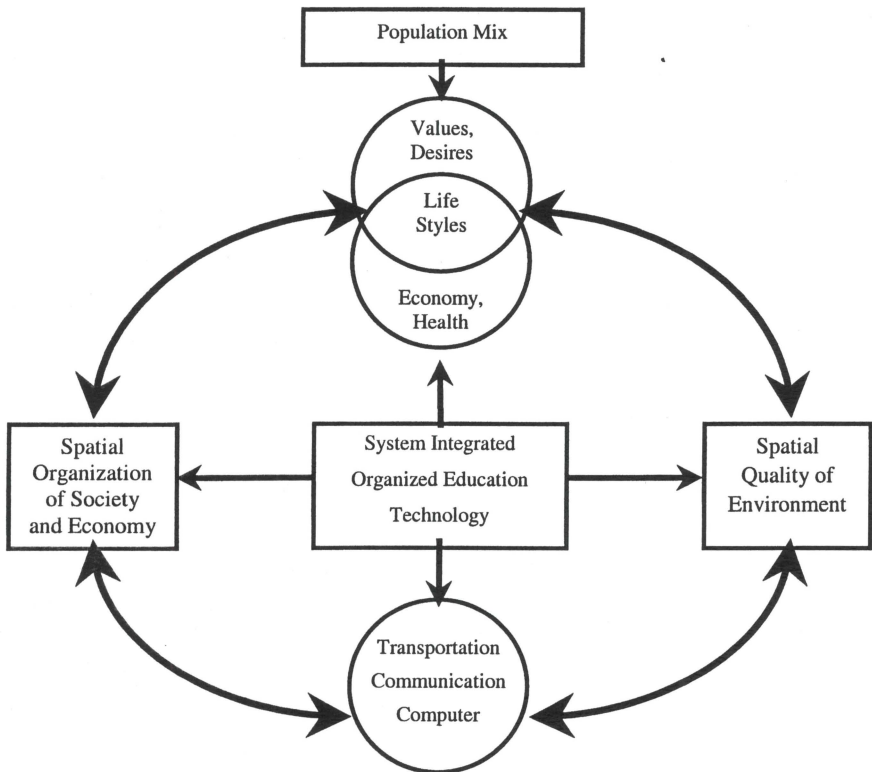


Fig. 1. Systems Integrated Organized Technology (SIOT) and education development

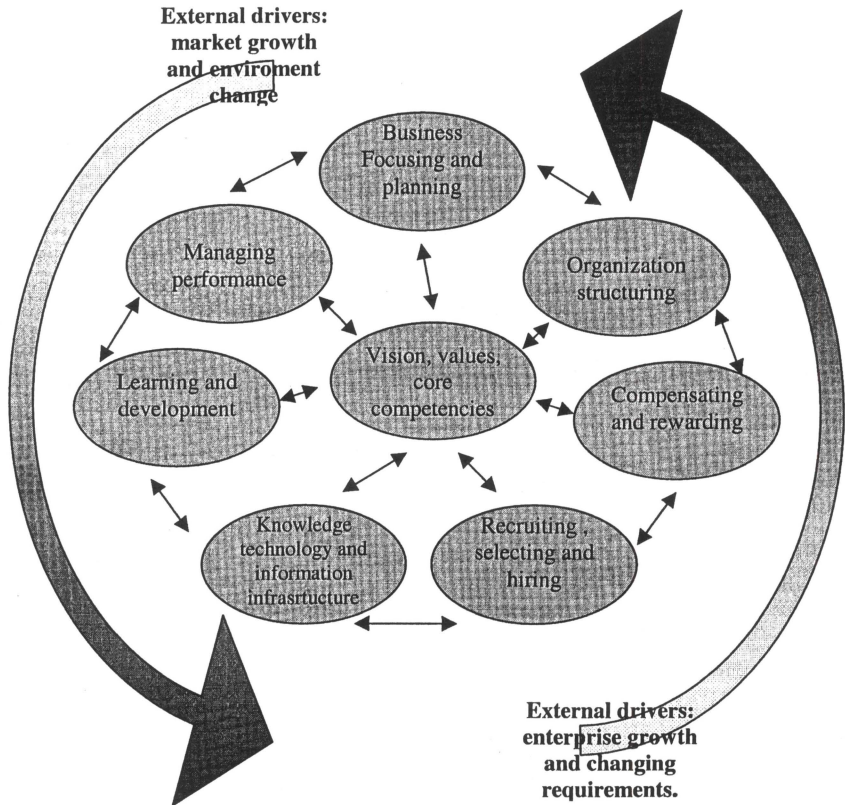


Fig. 2. Aligned systemic elements. Tapscot D., Lowy A., Ticoll D.: Blueprint to the digital economy. McGraw-Hill, New York, s. 103.

The grand strategy for Poland and the all Polish regions and educational sectors over the next 20 years should be based upon the intensive use of new technologies in the areas such as telecommunications, computers, high and very high speed transport, and new agglomeration technologies (*the widely networked agglomeration construct*).

The intensive use of new technologies should be supported by the lifelong education process. Does the future world of growing international interdependence and approaching new technology

frontiers demand of all countries and regions within countries to behave so as to carry out their international responsibilities? It must namely be born in mind not only the national economic development features, but also the regional and national development pitfalls could produce substantial increase not just merely in the national, but also international instability.

If competitiveness becomes the key future development issue within the national, as well as international, perspectives, then all the intra-country regions will need their own grand strategy for at least 20 years ahead. It is not a role for the knowledge sectors to try to design such grand strategies for any given region, but rather to consider several cases and to prepare methodological guidelines based on generalization of international experience.

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