

## Vloga univerz kot ustvarjalk znanja v družbi znanja

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*V prihajajoči družbi znanja postaja znanje ključni faktor v proizvodnji in distribuciji dobrin in storitev ter v organiziranosti družbe. Širitev znanja po svetu, omogočena z informacijsko-komunikacijskimi tehnologijami (ICT-ji) in uporaba tega znanja bosta imeli vpliv na družbo kot celoto in na vse inštitucije v družbi, vključno z univerzami kot tradicionalno najpomembnejšimi ustvarjalkami znanja. Članek predstavlja nekatera splošna dejstva o družbi znanja, govori o karakteristikah znanja samega in o njegovem merjenju, o spremembah v proizvodnji oz. ustvarjanju znanja in zaključuje s predlogi o vlogah, ki naj jih privzamejo univerze kot proizvajalke znanja, da bi preživele in se uspešno razvijale v prihajajoči družbi znanja.*

**Ključne besede:** Družba znanja, znanje, ustvarjanje znanja, univerza.

## Role of Universities as Knowledge Producers in the Knowledge Society

*In the coming knowledge society, knowledge is becoming a primary resource in production and distribution of goods and services and in the organization of society. The spreading of knowledge around the world, enabled by information-communication technologies (ICTs) and utilization of that knowledge will impact the society as a whole and all its institutions – including universities as the – traditionally – main knowledge producers. The article presents some general facts about knowledge society, talks about characteristics of knowledge itself and its measurement, about the changes in the knowledge production and, finally, concludes by suggesting the roles which universities should play as knowledge producers in order to survive and prosper in the coming knowledge society.*

**Key words:** Knowledge society, knowledge, knowledge production, university.

### Introduction – the knowledge society

There is a consensus among the public actors that we are entering a new phase in the history of mankind. Instead of capital it is knowledge that is becoming a primary resource in production and distribution of goods and services and in the organization of society.

Even though some authors claim that it is information society, for it is predominantly based on information, Delanty claims that it is knowledge society that we are entering, because knowledge is central to the information economy, to telecommunication systems, to technological systems, to politics and to everyday life, and there is nowadays even an extension of knowledge into the cultural domain (Delanty, 2001, pg. 152).

In the past, nation-states gained comparative advantage towards other nations through a unique combination of traditional production factors, such as land, labor and capital, while nowadays, in the context of a global, knowledge-based society, a nation's comparative advantage comes from a collective ability to leverage what its citizens know.

Because more and more knowledgeable people are being employed to solve problems and develop high-tech products (and being paid more to do it), the pace of change will continue to accelerate. Furthermore, because knowledge causes goods, services and knowledge itself to become obsolete quicker, volatility permeates the world economy today. Thus whole new products and industries can be developed within a fairly short time span and they can be eliminated also.

In this volatile world the main question becomes which technologies, innovations, etc. will lead the way into the future. The problem is that new science and technology does not have immediate usefulness (Delanty cites e.g. laser, whose invention enabled a multitude of applications, but whose usefulness at the very beginning was limited to a few fields of application (Neef, 1998, pg. 8); the same goes for nanotechnology today (article author's remark)).

Low and medium skilled workers will increasingly be moved away to low-cost labor markets or their work automatized and replaced by robots and other equipment, forcing a further shift towards »knowledge-based« industries and services. Knowledge based work causes two problems – 1. it is hard to measure; 2. it is resistant to productivity increases, because telling knowledge workers (e.g. doctors, laboratory researchers) to produce the same results in half the time either lowers the quality of results or is even impossible to do. The possibility is to provide them with better equipment to increase their efficiency or to simplify their tasks (article author's suggestion).

Another article in the book (Neef et al., 1998) by Richard Nelson and Paul Romer analyzes the position of the United States in the world economy and argues that the U.S. with increased focus on individual and direct R&D grants is underestimating the enormous indirect value of »open«, public-funded research, which it has on the society as a whole and furthermore – in its drive for efficiency, the U.S. may well be restricting, rather than encouraging, the free flow of knowledge and innovation (probably through patenting and other measures of hiding/protecting of information and knowledge – article author's comment).

There are many changes due to happen as we enter the knowledge-based society. One of the main changes is that ICT's – information and telecommunication technologies – are allowing ideas to flow instantaneously and coherently around the world. Thus, all this information is enabling developing economies to quickly build a highly competitive production infrastructure, capable of manufacturing high-quality products at the fraction of the labor costs of traditional »advanced« economies. Thus more and more production and sales is being relocated around the world towards the developing economies, while in the developed economies, there is an increasing drive towards »weightless« economy – based on services (including knowledge industries). What this shift towards »weightlessness« also implies is that productivity in developed economies is falling, primarily because of two reasons:

1. one reason is that some service industries (e.g. such as doctors and teachers) are resistant to productivity<sup>1</sup> increases, because their work requires enough time to accomplish the task;<sup>2</sup>
2. another reason is that as the primary (agriculture) and secondary (industry) sector is shrinking, workers' productivity levels are rising, while as the tertiary (services) and

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<sup>1</sup> Productivity increase is defined as the time needed to accomplish a certain task or the quantity of a product – author's comment.

<sup>2</sup> With the two possible solutions being the simplification of tasks and automation of the work processes as much as possible, as already mentioned; however, there is often general inertia towards changes (in productivity) present, caused by irrational behaviour of actors (article author's opinion).

quartary (knowledge services) are rising, the workers' productivity levels in those two sectors of the economy are falling.

Behind all these national trends, there is a deeper shift in the world, which can be summarized in one sentence – the rise of the non-national organizations. New developing markets with low labour costs and many opportunities for development are the pull, while high tax rates and high labour costs of developed economies are the push for companies to relocate from their home bases. Also, with development of electronic communications, capital markets, advanced transportation and easily transferable technologies, companies are able to more freely operate around the world. All this will cause that businesses and other organizations will become members of non-national conglomerates (e.g. in telecommunications – World Partners includes American AT&T and 16 other companies in 31 countries around the world or Global One – Deutsche Telekom, France Telekom and (American) Sprint), and will be able to move their assets and skills around the world in order to avoid any legislated pressures that governments are trying to place on them.

Thus the knowledge-based economy with key characteristics of knowledge-based businesses, new technologies and unbounded globalization, will undermine the very nature of the nation state, where nation's comparative advantage was based upon a combination of natural resources, labour, capital and a balance of governmental, social and economic stability within its borders. Allegiance to the organisations rather than to nations will become paramount and comparative advantage for organisations will become access to ideas, human capital and the ability to create and deploy innovative new products and services (Neef, 1998, pg. 3-16).

## **KNOWLEDGE**

Before being able to talk about universities as knowledge producers, we have to first look at knowledge - its characteristics and its measurement.

Knowledge, including technical knowledge, has the following distinctive characteristics:

- knowledge is intangible;
- it is cumulative;
- it cannot be consumed;
- it is easily transmitted;
- it is transnational in character.

To discuss these properties in more detail, we can say that technology and all other knowledge are intellectual commodities (intangibles). In essence they are information which enables the production process. For ordinary goods, their structure and content determine the utility and thus, value, to the consumer, while for intellectual goods, the utility lays in an ever-increasing knowledge base, which enables the production of a continuous stream of new products and services.

Knowledge has a cumulative character, meaning that the present stock of knowledge in the world results from humanistic, scientific and technical developments of the past generations. However, because of cumulative properties, it is sometimes hard to link a discovery which extends our understanding of the world with a concrete innovation, which comes from a general idea.

Technology does not wear out physically. If we look at technical knowledge, which is a prerequisite for products and services, it wears out only economically, whereas material goods wear out both physically and economically. Because of inconsumability, knowledge can be bought and sold almost limitless number of times, without diminishing its value. Thus the law of diminishing returns, which applies to all other economic goods, does not apply to knowledge. Furthermore, the sales revenues are many times greater than the »costs« of technology production. The elasticity of supply of knowledge is thus close to infinity, which is not typical of any other good or service.

Knowledge is also very mobile, thus the lag-time between discovery of new knowledge and its dissemination around the world has, because of modern information-communication technologies (ICTs) shortened dramatically. There is a term being used for world becoming »a global village«, because the flow of information is so much faster, cheaper and easier than ever before in the history of the mankind, especially due to modern ICTs.

Knowledge (including technical knowledge) is particularly suited for globalizing forces of today's world. It's nature is transnational, and thus it flows around the world through many channels, both commercial (proprietary) and non-commercial (non-proprietary). Ideas created in one country are developed (appropriated) in other countries. Even though in the short run non-proprietary knowledge is accessible quicker and flows more freely (because it is not protected by patents and other means of intellectual property), in the long run both proprietary and non-proprietary knowledge are being diffused around the world (UNIDO, 1996, pg. 22).

Regarding measurement of knowledge, more and more companies (Institute of Management Accounting mentions even 70% of all) are experimenting with non-financial performance measurements (e.g. Balanced Scorecard), which are mostly focused on the productivity of human and intellectual capital. Nevertheless, knowledge measurement in the economy and at work is a whole new area of development and poses many issues.

One of them is measuring knowledge itself. Knowledge has three properties different from goods and services:

1. it is not separable – it stays with the one who sold it even after the sale;
2. additional »units« of the same knowledge yield no extra value to the person with the knowledge, thus new knowledge is better than more knowledge of the same kind;
3. value of knowledge is unknown until it is acquired and applied; thus the stock of knowledge cannot be evaluated, but the value of knowledge is in the flow; especially tacit knowledge value is hard to measure, because its value is unknown until tacit knowledge is gone.

Also, since knowledge is embedded in products and services, it undergoes significant changes over time, thus it is difficult to evaluate the level of output of knowledge. There is nowadays an increasing proportion of intangible to tangible value of products and services and some products/services emerging, which are knowledge-based, meaning that they are intelligent – adapting each time the product is used, thus being hard to define.

Another problem is that boundaries of producing units are changing, thus as connections between different economic actors are growing in the knowledge economy (e.g. suppliers codevelop products with manufacturers, manufacturers are conducting more and more customer surveys, etc.), or – to put it differently – the boundaries of companies and other organisations

are becoming more permeable, and thus the connections are becoming more complex, it is harder to measure how much value each agent has added in the value chain.

Furthermore, knowledge causes spillover effect (externalities), meaning that learning something can enhance learning something new or it can interfere and thus the discovery of new knowledge is path dependent – where you look for knowledge is where you will find it, even though new knowledge does not have necessarily the properties which you expect to find. Thus the externality effects of knowledge may change and the change, which is caused by knowledge, causes externalities as well.

Problems arise also, because investments into knowledge are meta-investments, enabling companies/organisations to do things they had not been able to do before as opposed to direct investments into development of a certain product or service, and also, because it is hard to specify the timing of knowledge obsolescence. Some knowledge may last a long time while other may have a pretty short useful life, thus there are no exact schedules of depreciation. However, when knowledge becomes obsolete, the value of the stock of knowledge drops to zero immediately.

To summarize, knowledge is context dependent and thus has a different value to those who might acquire it, thus only the results of knowledge are meaningfully measured. Because knowledge causes humans to learn, measuring it causes those who measure it to learn, compromising the measurement itself (reflexivity), because new and better measurements are needed. Knowledge performance measures thus have to be designed with the expected change in mind (flexibility of measures). In general, it is more informative to measure changes, which knowledge causes rather than knowledge itself or the current performance of organisations. One such approach is real options approach, which allows managers of organisations to measure uncertainty and organisational flexibility, which knowledge brings with it (Siesfeld, 1998, pg. 193-202).

## **ROLE OF UNIVERSITIES AS KNOWLEDGE PRODUCERS IN THE KNOWLEDGE SOCIETY**

These changes have impact on the universities as well – the universities should change the role which they are playing in the society. They cannot exist as ivory towers any longer, separated from the practical aspects of everyday life. The reason why they should change is twofold:

1. on the one hand the role of the national states is changing (as already mentioned, in a more and more globalized world, the national states are losing their power), thus the implicit contract between the university and the state in terms of universities safeguarding the national interests of the state are changing; this fact is changing the university organisation into certain disciplinary fields (e.g. physics, mathematics, sociology, etc. - instead of specialized departments multi- and cross-disciplinarity is the norm) as well as the cultural role, which universities used to play as preservers of the national identity in collaboration with the state (the national aspects are giving way to cosmopolitan aspects); consensus on what constitutes knowledge has been replaced by dissensus and the national culture, preserved and reproduced in the university is being contested;
2. on the other hand the knowledge is more and more produced by other social actors (e.g. companies and NGOs) and not just universities, thus there is an increasing competition in the market for knowledge; this fact is making universities more like other organisations (e.g. companies), and at the same time being reduced into the role played in technocratic consumerism by which students become mere consumers of knowledge

and the university a transnational bureaucratic corporation which is trying to »excell« in its activities.

The loss of certainty which begun with 19th century cultural norms has extended into uncertainty in science today and thus a crisis of identity of the university and increased risk management. However, in the knowledge society, cognitive processes not only produce knowledge as content, but create new cognitive structures and identities and, because the university occupies a space in which different discourses interconnect, the role of the university in the knowledge society is enhanced, not undermined.

The knowledge can be primarily defined – according to the author of the book – as the knowledge as science and the knowledge as culture. Accordingly, the university, when shaping knowledge as culture, has become a major site of battles of cultural identity. However, in the area of knowledge as science, overrationalizing knowledge (overanalyzing) could cause the university rationalizing itself out of existence, if the counterweight is not an increase in the reflexivity in the knowledge production. Reflexivity can be defined as a tendency for institutions and individuals, to increasingly monitor their behavior and actions by means of knowledge. This can be seen as an increase in expert systems, which offer interpretations of social reality for individuals. Reflexive application of knowledge to itself also generates new cognitive fields (Delanty, 2001, pg. 152-153).

Thus the knowledge is changing from Mode 1 to Mode 2 knowledge. In mode 1 knowledge, »problems are set and solved in a context governed by a small group of scientists, generally the academic community (Delanty, 2001, pg. 109)«. The university is the place where research is being carried out and where the results of research are disseminated. On the opposite, in Mode 2 knowledge, »knowledge is shaped in the context of its application, which is generally outside the university (Delanty, 2001, pg. 109)«. In Mode 1 knowledge is disciplinary and hierarchical, while in Mode 2 it is transdisciplinary and fluid. Mode 1 knowledge is also relatively autonomous and homogeneous, coherent, transcendent and self-referential while Mode 2 is more heterogeneous, socially accountable and reflexive. The theory of knowledge states that Mode 2 knowledge is more democratic, because knowledge users are more and more involved in the production of knowledge, making knowledge more relevant to concrete applications. In today's postmodern (postindustrial) society, knowledge is no longer something abstract (meta-narrative), but has entered the production process as a new production factor and is being generated in the context of application. To put it short – »knowledge for its own sake« is being replaced by »knowledge for use« (Delanty, 2001, pg. 102-110).

The four types of knowledge and their corresponding roles in the knowledge society are the following:

- 1) research, which includes basic research and the accumulation of information; the knowledge role which fulfills this task is the expert;
- 2) education, which relates to human experience and the formation of personality; the role corresponding to this task is the role of the teacher;
- 3) professional training, which concerns itself with the practical vocational training; the according role in the knowledge »industry« is the professional trainer;
- 4) intellectual inquiry and critique, which deals with wider public issues of society and the intellectualization of society, with the corresponding role of the intellectual.

What Delanty states for universities as knowledge producers is that – as the state retreats from the role of provider to the role of a regulator – the state will no longer be the sole financier of knowledge and thus universities will have to look to other forms of financing. Furthermore, new knowledge producers are emerging and thus the site of knowledge production is being increasingly occupied by a range of non-university producers – e.g. industrial laboratories, research centres, think-tanks and consultancies.

In the era of modernity (the last 500 years; the new ages, article author's remark), the modern university encompassed the Enlightenment ideal of the university being the »republic of science« - an autonomous institution, promoting the emancipation of scientific disciplines. The university, with its »caste« of intellectuals, played the role of the knowledge guardian, transmitting knowledge to society as indisputable laws. However, the postmodern role of the intellectual is more like that of an »interpreter«, trying to interpret the world around us, rather than impose universal truths.

This is connected to the postmodern – risk – society, which is a self-critical society and in which the unquestioned belief in the rationality of science and the idea of neutrality of knowledge is no longer credible. There are new links being forged between society and knowledge as education is being more available to the masses, and ceases being an exclusive privilege of the elites. Information is becoming the most important resource and is sometimes even challenging the primacy of material security.

All this leads to the fact that the traditional roles of universities are in crisis and that the ivory tower is collapsing. The society is pushing for greater accountability of universities towards the society. Knowledge is being globalized and detached from its traditional reliance on the nation state and its custodians – intellectuals and university professors. Also, knowledge is becoming more fragmented – application of knowledge gives rise to specialization and thus the knowledge agents and the knowledge itself are becoming decoupled and recombined in new ways. Thus Mode 1 is more and more giving way to Mode 2 knowledge.

There is a rise in managerial practices being implemented in universities. Universities are – because of globalisation and other changes in the society – forced to implement new regimes of management that more closely resemble businesses than the traditional sites of autonomous knowledge. Universities are increasingly competing for students, the best professors and their share of state's diminishing budgets. The humanistic intellectual has increasingly been overtaken by the administrator and the academic entrepreneur, the so-called »businessman of science«. Departments have to generate funding for research, thus funded research has priority over free and unbounded research and the highest mark of academic achievement is becoming entrepreneurship. Deans and heads of departments are starting to resemble managers rather than academic figures and thus they behave accordingly – they compartmentalize tasks, take full managerial control and systematically calculate costs for each step of the process. With one sentence – service delivery is being commodified and professional autonomy is being eliminated.

While this has as its aim greater efficiency and effectiveness, the results behind academic managerialism are often quite the opposite – because of the nature of knowledge production, academic self-governance is not time-efficient and often has a strong tendency – because of intellectuals' love of titles (article author's remark) – towards hierarchical structures, the very mode of managerial practice which has long been abandoned in the most successful companies. To put it short – by uncritically copying managerial practices from companies the universities are often doing more damage than good; nevertheless, if the universities do copy such practices, they should learn from the best and most successful companies (article author's comment).

On the other hand, the knowledge users – especially companies – are becoming more and more like universities – companies give employees study sabbaticals and other forms of training possibilities. The ultimate in this sense are American corporate universities, where large

corporations establish their own universities (e.g. General Motors university in Chicago) (Delanty, 2001, pg. 108).

Another large trend is becoming the separation of teaching and research in universities. Traditionally (the Enlightenment model) professors gave lectures which formed the core of their writings. As researchers are increasingly working on specific problems and are frequently condemned to obscurity in an ever-expanding publishing industry, researchers' knowledge is becoming overly specialized and thus irrelevant to the immediate needs of students. Besides, many academics have, because of specialization, lost a sense of the overall significance of their research (the big picture), thus they are losing themselves in endless details, while on the other hand academic standards among students have been falling, thus there are many academic communication gaps forming between students and teachers/researchers when conveying knowledge (Delanty, 2001, pg. 110-112).

## CONCLUSIONS

The way in which universities should change – in accordance with all the aforementioned by Delanty – should be the following:

- a. a university should become a site for *interconnectivity* of different kinds of knowledge in the knowledge society (the reason for this is that today there are increased findings that there exist different types of knowledge (instead of one unified type as shown in the beginning of the previous chapter), however, there does not exist an institution which would open different avenues of communication between these different types of knowledge (NOT uniting them!));
- b. in this manner, the universities should give expression to the new social bond which is emerging in postmodern societies which is *communication* – postmodern societies will not be integrated by national cultures or money or power, but instead by communication; complex modern societies are not based on values or roles but instead on differentiated systems of communication; and because the public sphere is being increasingly »colonized« by media under influence of money and power, universities should recover the public space of discourse that has been lost in the decline of the public sphere (Delanty, 2001, pg. 6-7).

Specifically, the universities can change according to the three types of communicative interconnecting:

1. new links between the university and society – as more communication occurs between expert systems and lay public, the university will become an important site of public debate between expert and lay cultures;
2. new links between the sciences – because there will be more and more cross-disciplinary communication between disciplines and the sciences as a whole, university will have to become a site of interconnectivity between the diverse forms of knowledge;
3. changing relations between the university and the state – as the state is becoming increasingly a regulatory agency and less exclusively a provider state, the university will be forced to negotiate with non-state actors regarding the provision and distribution of knowledge; one solution is the creation of diversity of universities, designed to fulfill

different functions, and another solution is – according to Delanty – in creation of more and smaller universities rather than in the economies of scale.

However, there are many dangers looming ahead as well. One is that instead of multidisciplinary, the university will embrace »postdisciplinarity« in the meaning that it will focus on bureaucratic or financial goals only – the result of such university would be purely managerial or entrepreneurial exercises in »academic capitalism«, as has already been mentioned before. This danger is real due to external pressures of globalizing forces of the market system upon the academic freedom (author's comment).

Another risk is that the university has to open sites of communication in society, rather than become a self-referential bureaucratic organisation, forming a self-legitimizing and autonomous society within the larger society (a kind of new age ivory tower, which is instead of being a totally non-profitable organization as in the age of modernity, becomes the other extreme – an exclusively profit driven organisation, without any recourse to non-profitable causes and actions).

Thus the Delanty's idea is that university should become a place where there exists an idea of dissensus, while still unifying people together in a communicative interaction – a debate, instead of (political) consensus and the common identity (Delanty, 2001, pg. 1-11).

Thus the university should be a place where people unite in a discussion and experimentation without imposing on them unifying ideas of the common culture and ways of behaviour and/or the common nation-states. If certain common ways of behaviour do want to be imposed, they have to be done through a process of communication, trying to find a win-win situation for both without one side or the other imposing strict rules upon each other – it's a dynamic process of negotiation, and not a specified order.

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