

TRIPLE HELIX EVALUATION: HOW TO TEST A NEW CONCEPT WITH OLD INDICATORS?

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Subtheme: S2 Triple Helix study

Key words: Triple Helix indicators, measuring collaboration

Introduction

Triple Helix concept encourages actors (university-government-industry) to work in an open space of circulation of aspirations, knowledge and innovation. This open space of circulation is a novelty (Dzisah & Etkowitz, 2009), which requires deep understanding and internalization as a personal and collective value where collaboration is a source of a sustainable success. To evaluate how much Triple Helix as a social organization novelty is contributing to an overall prosperity, indicators consistent with this new conceptual framework are needed.

State of the art of the topic

In last 20 years Triple Helix has been developed into a widely accepted conceptual framework which brings together knowledge, consensus and innovations of three (or four) major social actors: university - government - industry (and civil society) and provide better cradle for social and economic development (Etkowitz & Leydesdorff, 2000; Etkowitz, 2006; Gibbons M. et al., 2004). But the departure from Triple Helix as an intuitive guide for policy makers and researchers to a model of social organization requires further work on identifying relations between major actors, their capability of collaboration and measuring their impact on societal capability of solving problems. By using some recent work on identifying indicators for measuring entrepreneurial activity (Acz & Szerb, 2009), each actor can be described in terms of attitudes, actions and aspirations. Interactions among Triple Helix actors bring different attitudes, actions and aspirations into continuous interactions which contribute or prevent collaboration.

Underlying systems theory (von Bertalanffy, 1968) in conceptualization of Triple Helix helps to identify some features very important for the purpose of using Triple Helix in design of public policies:

- Triple Helix is an open system which functions on the principle of equifinality. The principle of equifinality is source of hope, because the same final state may be reached from different initial conditions and in different ways, what means that present conditions do not determine the potential to achieve expected goals. This leads to the question about capabilities (Robeyns, 2005) (knowledge,

skills, willingness, collaboration, regulatory framework, resources...) of each social actor needed to reach equifinality.

- Progress is possible only by passing from a state of undifferentiated wholeness to a differentiation of parts (Luhmann, 2006). Organizations must balance differentiation (King, 2008) and integration to be successful (Lawrence & Lorsch, 1967; Corning, 1995), but highly differentiated sub-systems could have problems in finding common interest for integration. This leads to the question on mechanisms of reaching a consensus on issues which can unite different actors.
- Behavior cannot be reduced to utilitarian principles of adaptation of the individual – human being is not a passive receiver of stimuli coming from external world, but a creator of the own universe. This leads to the question how to develop sense and responsibility for actions on individual and institutional level (subsidiarity principle, access to opportunities).

In addition, there is a question how to measure this collaborative feature of Triple Helix concept. There are some new concepts of measuring performance of social, economic and political systems (e.g. competitiveness, corruption, economic freedom, innovativeness, entrepreneurial capacity, governance...), which mostly implicitly refer on interdependence of different stakeholders, but there is still quite limited focused work on this issue (e.g. Jaffe, 1998; Leydesdorff, 2003; Leydesdorff, Dolfsma, & van der Panne, 2004; Campbell, Powers, Blumethal, & Biles, 2004). It is interesting that Triple Helix concept especially struck experts in natural sciences (e.g. Priego, 2003; Edwards, Murray & Yu, 2003) as well as in the field of regional innovation systems (e.g. Huggins, Jones & Upton, 2008; Seravalli, 2009).

What is common to all of those works is that it relies on present availability of variables and indicators. It means that new concepts are supported by old variables and indicators. And that is also a case with the Triple Helix concept which brings novelty of open space, but its evaluation is limited by the availability of descriptors (variables and indicators) mostly focused on a specific dimension of Triple Helix, not on its collaborative feature.

Research focus - what do we measure in social organizations?

Implementing set of processes on inputs, social organizations produce results which can be identified as outputs, outcomes and impact. Using the OECD definitions as the basis (OECD, 2002), following distinctions could help in the discussion on developing indicators based on Triple Helix concept:

Outputs are *immediate results* of a social organization's activities: products, capital goods and services; may also include changes resulting from these activities which are relevant to the achievement of outcomes. Social organization **controls** its outputs.

Outcomes are *observable behavioral, institutional and societal changes* (that take place over 3 to 10 years) in the actions of social actors that have been influenced, directly or indirectly, partially or totally, intentionally or not, by activities or outputs of the observed social organization(s) that potentially contribute to the improvement in people's lives or of the targeted environment. Outcomes are short- or medium-term effects of a social organization's outputs. Outcomes usually result from *coordinated* short-term investments in individual and organizational capacity building for key development stakeholders (such as national governments, civil society, and the private sector). Social organization only **influences** outcomes, through its outputs.

Impact is defined as positive and negative, primary and secondary *long-term effects* produced by a development intervention, directly or indirectly, intended or unintended. Impact is observed in long-term, sustainable changes in conditions of people's lives and the state of the environment that structurally reduce poverty, improve human well-being and protect natural resources. Social organization **contributes** partially and indirectly to these enduring results in society or the environment, through its outcomes and outputs.

Differentiated features of the results of social organization's functioning are based on time dimension, as well as on ownership over results, what is very important for the discussion on indicators related to Triple Helix concept. It is obvious that outputs are fully controlled/owned by social organization which produces them, but control/ownership intensity over outcomes is lessening. In the case of impact this control/ownership relationship is very difficult to connect with outputs of a specific stakeholder, even more difficult if there are multiple mechanisms for delivering outputs and transforming them into outcomes, as it is the case with stakeholders involved in Triple Helix interactions.

Another aspect of measuring social organization's activities through efficiency, efficacy and effectiveness can be connected to the identified differentiated features of a social organization's results (outputs, outcomes, impact).

Outputs can be measured by efficiency and efficacy: *efficiency* indicates how economically resources/inputs are converted to results, i.e. efficiency measures a process (good input to output ratio) and *efficacy* says at which extent targets are met (getting things done).

Outcomes can be measured by *effectiveness* (Drucker, 2006) which indicates if identified targets of a social organization are set the way that their outputs can influence achievement of some broader goals rooted in the needs of the society or environment – how much identified targets are relevant (doing „right“ things). Effectiveness can further be enhanced when activities of different actors within a sector are coordinated and harmonized.

Impact is a synergetic effect of multiple mechanisms for delivering results, and cannot be fully traced back to individual actor's output(s). Level of *collaboration and partnership* in contributing to solving identified problems of the society and environment is a key element for achieving or not achieving expected impact. Measuring impact requires strong conceptual background, well designed indicator(s), as well as overall literacy in understanding and using those indicators in decision making processes but also in mobilizing public interest for problems in the society and environment.

Methodology

This paper is based on desk research using selected key-words from three sub-topics: conceptual soundness of Triple Helix, indicators for measuring progress and presence of Triple Helix in policy documents of European Union.

Findings

Is Triple Helix as a social organization novelty ready to be measured?

Despite the history of civilization is based on interactions, competition and collaboration, Triple Helix can be labeled as a social organization novelty, because of two major features of this concept. First, the collaboration as a dominant principle of Triple Helix concept is linked to a notion of opening the space for circulation of knowledge in order to provide a continuous innovations / improvements for all, not for privileged minority. Second, the clear accountability for collaboration on this goal of all three (or four) stakeholders – government, business sector and university (and civil society) is clearly identified (Dzisah & Etzkowitz, 2009). Overwhelmed with long lasting world problems (exclusion of many from access to opportunities; poverty; environmental deterioration caused by human actions based on selfish interests of privileged groups) everyone with moral integrity should find the way how to use all available resources, primarily knowledge and willingness, to speed up the process of solving those issues. Triple Helix is a valuable concept to make it happen through collaboration of major stakeholders even if they have competing interests.

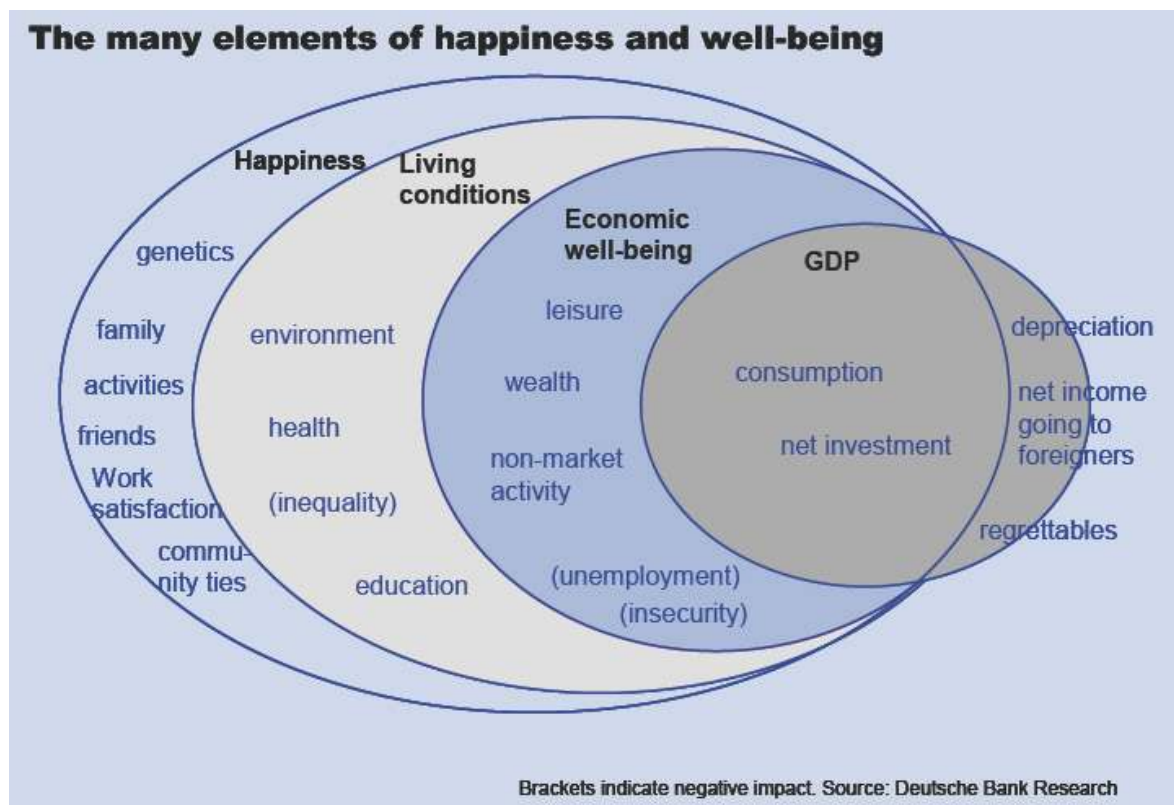
This departure from living (on the first glance) their own lives and from interactions among business sector, university and government based on time-to-time interests toward Triple Helix concept requires capacity to collaborate in a changed paradigm. Changed paradigm in which each stakeholder functions is focused on understanding stakeholder's role in SOLVING problems, not only related to its own functioning, but problems of its immediate and broader environment. Through this changed paradigm, Triple Helix is well linked with the concept of *subsidiarity*, because it identifies stakeholders and their accountability for actions. At the same time it corresponds with Reich's (1991) concept of *competences / capabilities* needed for confronting with issues of 21st century: how to identify problems, how to solve problems and how to exchange ideas.

Triple Helix concept specifies functions and their carriers as: (1) wealth generation (industry), (2) novelty production (academia) and (3) public control (government) (Leydesdorff & Meyer, 2006). It helps to measure their respective outputs (efficiency and efficacy) and outcomes (effectiveness). Besides efficiency, efficacy and effectiveness of each social actor involved in Triple Helix interactions there is synergetic effect of those interactions. Since Triple Helix interactions among University-Industry-Government present networked

infrastructure for knowledge-based society, these interactions produce synergy which could be expressed as a sustainable vitality of a society.

There are plenty of indicators focused on measuring outputs on the level of industry, academia and government, independently of each other, but there are much less systematic approaches in monitoring influences of outputs of those social actors (industry, academia and government) on outcomes (effectiveness). Measuring synergetic effect of Triple Helix interactions expressed as sustainable vitality of a society still struggle with definitions what to measure (Jordan, 2008).

Figure 1 – What is measured and what should / could be measured



Source: Deutsche Bank Research, 2006

As chart in Figure 1 suggests, there is no consensus even on the structure of the GDP as the most used synergetic indicator of the well-being – many think that it should be corrected by subtracting values of capital consumption (“depreciation”), income exiting the geographic/political entity for which GDP is calculated (“foreigners”) and production of goods that restore something what already existed, but were destroyed by the nature – e.g. flooding, earthquakes or human intervention (“regrettables”).

Work of many prominent economists, including Nobel laureates like Sen (1976), Stiglitz (2005) and Yunus (2008) argue that new definition of a well-being as well as appropriate indicator or indicators are needed urgently. Triple Helix concept contributes to this discussion very directly. Social novelty of Triple Helix concept provides insights into different institutional arrangements on which capacity for sustainable well-being depends, but there is not enough work on measurement aspect of it.

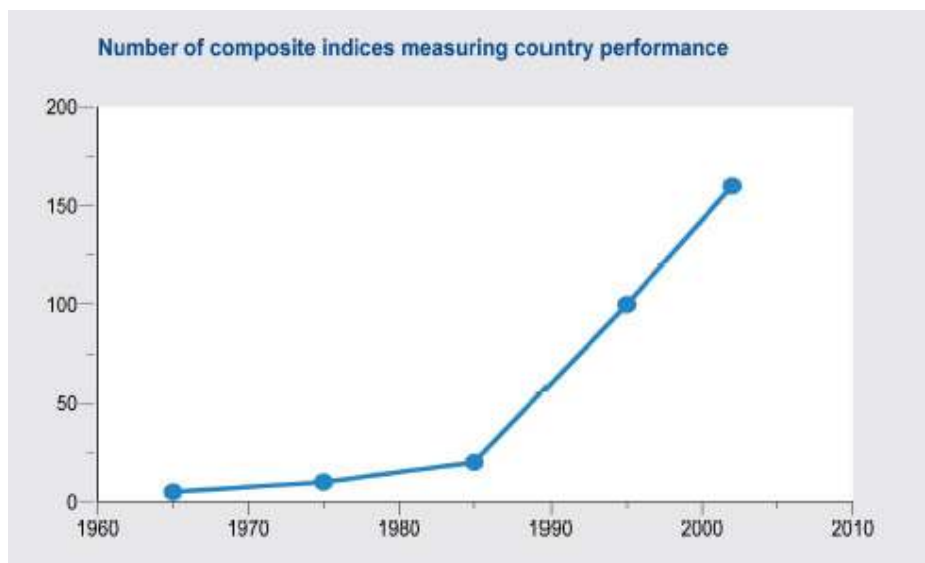
From few indicators to indicators’ industry

Not each piece of data is an indicator – OECD defines an indicator as a quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor.

Historically, indicators always emerged when some interest groups (researchers, business sector, government) or public made a pressure to deal with some issues. They never resulted from anticipating the situations which could arise and be monitored and controlled. It is how GDP was constructed by Simon Kuznetz and his team (as reaction on not having enough information about the state of the US economy, in 1932 the US Senate requested from the US Commerce Department to develop a uniform set of national accounts in order to provide comprehensive estimates of the national income). It imposes a serious question of effectiveness (not doing “right” things, either expressed through targets which do not fit with emerging needs or doing “right” things, but too late) as well as of efficiency (using resources for wrong purposes).

Growing number of indicators can be used as an approximation of growing awareness of complexity of interactions which impose new challenges in coping with changes which emerge on ever increasing pace. New insights in the way how systems function in any sphere of social life ask for new indicators, or redefinition of existing ones.

Figure 2 – Indicators’ industry is emerging



Source: UNDP Office of Development Studies, 2006, taken from Measurement Beyond GDP, 2007

This graph presenting growing number of composite indices measuring country performance in competitiveness, governance, social aspects, human rights, environment and security, indicates that the indicators’ movements is transforming into indicators’ industry in last twenty years. Entering indicators’ industry requires expertise, institutional support, time and money, what makes this business very expensive. Because of that it is important to try to get rid of overlapping, to collaborate on filling gaps and in testing the new indicators, and equally important to collaborate in using indicators’ in decision-making process in all spheres of social life (government, academia, civil society, business sector).

Therefore this industry (and its actors) has to go through the same test of measuring its outputs (using efficiency and efficacy criteria), outcomes (using effectiveness criteria) and impact. What is the impact of this rising number of composite indices? How much they are grounded in conceptual framework of solving such burning issues like poverty, exclusion, environment degradation? Do they indicate enough need for collaboration, and do they point sub-optima of using resources in achieving goals because of the lack of collaboration? Public awareness of such questions are rising and it is promising that some coordinated efforts are emerging (like the Global Project on “Measuring the Progress of Societies”, hosted by the OECD and run in collaboration with other international and regional partners, like the World bank, UNDP, UNICE, ILO, European Commission, Inter-American Development Bank, African Development Bank). This Global Project seeks to become the world-wide reference point for those who wish to measure and access the progress of their societies, but at the same time, the project aims to strengthen citizens’ capacity to understand the social and economic context in which they live. But, Triple Helix is not there, yet.

Is Triple Helix concept visible in the indicators' movement / industry?

For our discussion on measuring outputs, outcomes and impacts of Triple Helix interactions it is important to understand content of major indicators used on policy level. Since synergetic effect of collaboration is the least measured aspect of Triple Helix, the focus was kept on those indicators which are now used by policy makers as approximation of the well-being on country level.

Recent indicators' movement (Wesselink at al., 2007; Commission of the European Communities, 2009; Gertner, 2010) is challenging **Gross Domestic Product (GDP)** – its content and interpretation. From early 1930th when GDP was introduced, this indicator is universally applied using common definitions and methodology. GDP presents the market value of all final goods and services produced within a geographical entity within a given period of time. Such definition did not involve any activity without obvious market value, what excluded the family and shadow economy. At the same time, neither the value of leisure time spent with family and friends nor the value of environment is not included in calculating GDP. Limited capacity of GDP was recognized from the very beginning - its "father" Simon Kuznetz warned that "*the welfare of a nation can scarcely be inferred from a measurement of national income*" as defined by GDP (Kuznetz, 1934), and in his Nobel Prize lecture in 1971 he talked about ways how to improve the measurement of the GDP. Along the long history of using GDP this shortcoming was repeatedly commented and advocated for changes by many scholars, even Nobel laureates, like Joseph Stiglitz and Amartya Sen, who became both actively involved in developing new approaches in measuring the welfare of a nation: Stiglitz and Sen are involved in developing new approach for measuring nation's welfare for the French government (Stiglitz, Sen & Fittoussi, 2009) and Sen worked together with Mahbub ul Haq on development of Human Development Index, which was launched in 1990.

Human Development Index (HDI) succeeded to be recognized as a valuable indicator going beyond narrow concept of economic growth presented by the GDP, but not accepted as a replacement of the GDP despite that it was launched with such expectation. Used by the United Nations, HDI combines a nation's GDP with its citizens' education (measured by adult literacy and school-enrollment data) and its citizens' health (measured by life-expectancy statistics). Critical comments are mainly focused on arbitrary weights given to each of the three parts of this indicator.

Environmental Sustainability Index (ESI) and **Environmental Performance Index (EPI)** developed by Yale University and used by the World Economic Forum, track environmental sustainability and a society's capacity to improve its environmental performance over time. Those composite indices are filling a long-existing gap in evaluating environmental performance, but critics say that they are not backed by a grounded conceptual framework and that weights of building blocks are arbitrary identified.

Millennium Development Goals (MDGs) provide a system of goals and targets for global development, used by the United Nations. They are conceptualized for a 15-years timeframe, underlining mid- to long-term engagement and have high international recognition despite their future is not clear, since they have mandate to run them as a project till 2015.

There are many other indicators which aim is to correct, supplement or replace GDP, on international or national levels, like **Green GDP** in China (corrects GDP by monetized environmental factors), **Genuine savings** of the World Bank (provides estimates for savings and wealth stocks by considering environmental and social factors), **Happy Planet Index** of New economics foundation, UK (aggregates data on life satisfaction and expectancy with environmental footprint data in one index), **System of Economic and Social Accounting matrices and Extensions** – SESAME of Statistics Netherlands (satellite account describing economic, social and environmental aspects of human activities in an integrated framework), **Sustainable Development Indicators** – SDI of European statistical office, Eurostat (put GDP in the framework of other economic, social and environmental indicators).

There are some indicators which are a little bit closer to the conceptual framework of Triple Helix, like measuring university performance, entrepreneurial activity, competitiveness, innovativeness, corruption ...despite they describe some of dimensions of the concept, they do not refer to its holistic meaning as result of continuous multiple linkages among industry, university and government.

University performance is measured mainly through its research activities, but it is interesting that Berlin Principles on Ranking of Higher Education Institutions (2006) ask for measuring outcomes (effectiveness), not outputs only (efficiency and efficacy), but also ask for taking into account different missions and goals of higher

education institutions, not only research (specifically, it says that it should be taken into account if the institution is providing broad access to underserved communities).

Quality of business environment, as regulated by the government is described by different set of indicators, like the World Bank's Doing Business survey, Corruption Index developed by Transparency International and Political and Economic Freedom indicators developed by Freedom House.

Three surveys – on entrepreneurial capacity of a country (Global Entrepreneurship Monitor survey, from 1999), on innovation capacity of a country (European Innovation Scoreboard, from 2001) and on competitiveness (World Economic Forum, from 1979) are more than others focused on capability aspect of major stakeholders (academia, industry, government) to contribute to the impact defined through sustainable development. Capability of a society to develop and sustain capacity for innovativeness, entrepreneurship and competitiveness is obvious result of interlinked activities of academia, industry and government. It is a challenge to understand if different institutional arrangements would bring better results.

Browsing through description of listed indicators and reasoning behind them, no one refers to features of Triple Helix, i.e. to the capacity of stakeholders to take responsibility for sustainable well-being and how to measure their contribution to it.

The need to go beyond GDP was best expressed in the conference Beyond GDP organized by the European Commission, Club of Rome, OECD and World Wildlife Fund in 2007. The objective of the conference was to clarify which indices are most appropriate to measure progress, and how these can be integrated into the decision-making process and taken up by public debate¹. But, again, no reference to Triple Helix.

There are many follow-up activities, which intensified and broaden the public debate on this issue – European Union is very active in this debate, especially with its communication “GDP and beyond: Measuring progress in a changing world” (August 20, 2009) which outlines an EU roadmap with five key actions to improve indicators of progress in ways that meet citizens' concerns and make the most of new technological developments:

- complementing GDP with environmental and social indicators,
- near real-time information for decision making,
- more accurate reporting on distribution and inequalities,
- developing a European Sustainable Development Scoreboard,
- extending National Accounts to environmental and social issues in which it is said: “The Commission services will continue to explore – through collaboration with international organizations, dialogue with civil society and research project – how such macro-indicators could best be designed and used” (p. 8).

If Triple Helix was not recognized enough in the present indicators' movement, it is now time to get more actively involved and take such statements as a kind of open invitation. Triple Helix can contribute in conceptual (philosophical) debate, but as well as in debate on construction of indicators. One important contribution of Triple Helix conferences is developing the Triple Helix community by bringing together, from the very beginning, university, industry and government views on measuring sustainable well-being. It is especially in line with some other initiatives, like already mentioned the Global Project on “Measuring the Progress of Societies”, hosted by the OECD and run in collaboration with other international and regional partners, like the World bank, UNDP, UNICE, ILO, European Commission, Inter-American Development Bank, African Development Bank.

Implications - some conclusive observations and call for action

Rising curiosity for comparing internationally is a good sign of opening and it should be supported, despite of skepticism due to difficulties to recognize contextualization in which each country functions. It is not only important to find the best fit of descriptors of crucial attributes of major actors in Triple Helix concept, but to

¹ It is important to emphasise that public voice had an important role in accelerating this activity: more than two thirds of EU citizens feel that social, environmental and economic indicators should be used equally to evaluate progress (2008 Eurobarometer poll) and even three quarters of an international poll in 2007 conducted in ten countries on the five continents agreed with it (Special Eurobarometer 295/March 2008).

challenge how to measure sustainable well-being of the society which is always a synergetic effect. It is only question can we minimize sub-optima through knowing how to collaborate.

Instead of looking for a magic single number, which could “compress the immensity of national economy in a single data point of surpassing density” (Gertner, 2010) it would be more important to collaborate on getting consensus about the definition and measurement of human well-being, not only for one generation, but indefinite array of them², i.e. on sustainable well-being for all.

New technologies helped to solve some issues related to development and usage of different indicators, like shortening time of getting information and broadening the outreach, but indicators’ movement / industry must be closely built upon conceptualized frameworks, otherwise they only contribute to confusion. WHY, WHAT and HOW to measure are building blocks of a roadmap to be used for challenging any present indicator or a new one. Indicators (outputs, outcomes, impact) must be tested on two basic expectations: to provide feedback information on implemented approach and to be basis for a new decision on continuing with present approach or to change it. If changed approach is needed, then the new conceptual framework is potentially required. Conceptual frameworks linked to governance problems must precede measurements, because the starting question is “why and what we want to measure”. After that, the question of HOW to measure becomes a real challenge.

In the case of Triple Helix, WHY and WHAT is fully evidenced:

- WHY – collaboration as a social novelty offered by Triple Helix is needed to strengthen the overall capability to work on solutions of long-lasting problems like poverty, inequality in access to health services, education, political and business opportunities, inequality in having choices
- WHAT – new approach is needed to empower individuals and institutions to solve those long-lasting problems, and Triple Helix offers a conceptually new approach through continuously linked multilevel University – Industry – Government interactions.

HOW still remains a challenge. There are many indicators which describe certain aspects of performance of each of those stakeholders, but there is no consistent and coherent set of indicators which could be backed by the Triple Helix conceptual framework and provide a good basis for making needed interventional decisions (on policy, strategic or operational level). New conceptual framework(s) always ask for new indicators which would be better fit, but it takes time and costs to test conceptually new approach with new indicators.

Having this in mind and on-going debate on changing the approach and indicators in measuring sustainability of well-being, Triple Helix community have to step out more actively, from its own circle. Triple Helix conferences should be continuously used for sharpening the conceptual framework and building knowledge capacity in building indicators³, but it is of utmost importance to become the part of on-going mainstream discussion in indicators’ movement / industry. Triple Helix concept should be recognized on much broader policy scale as useful approach for improving overall capacity for solving identified development problems and to be the part of joint teams in working on new indicators’ structure.

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² It is useful to recall that North American Indians tested their decisions on exploiting natural resources on the criterion of seven generations – i.e. if our today's decision will endanger seventh generation from now, then it should not be implemented (International Institute for Sustainable Development). The choice of seventh generation is clever because it impose the thinking in the time frame which is far beyond our direct contact.

³ It would be good to build the knowledge base of Triple Helix conferences, by providing on-line availability of presented papers.

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