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THE EXPERIENCE OF INNOVATIONS IN GERMAN UNIVERSITIES AND REFERENCES FOR UKRAINE

In the world of globalization universities are now regarded as crucial national assets. Governments worldwide see them as vital sources of new knowledge and innovative thinking, as providers of skilled personnel and credible credentials, as contributors to innovation, as attractors of international talent and business investment into a region, as agents of social justice and mobility, and as contributors to social and cultural vitality.

German universities based on Humboldt's principles have been remarkably successful. They have provided an almost universal model for higher education. The highly interactive social setting and operational freedom of German universities has stimulated a creativity that has made them one of the great entrepreneurial centers of the modern world. They have been widely emulated and arguably are sources of radical thought and social progress in societies where they have been introduced.

German universities have become the principal locations for the national research base, and have led the way in developing the cross-disciplinary concepts that are increasingly vital if we are to address many of the complex challenges to national and global societies. Indeed, this flexibility and adaptability have become the hallmarks of universities. They are testimony both to a dynamic process of engagement in the pursuit and explanation of knowledge and to a sensitivity to the needs of the contemporary world and to the problems that preoccupy it. Universities operate on a complex set of mutually sustaining fronts – they research into the most theoretical and intractable uncertainties of knowledge and yet also seek the practical application of discovery; they test, reinvigorate and carry forward

the inherited knowledge of earlier generations; they seek to establish sound principles of reasoning and action which they teach to generations of students.

The innovation process has evolved considerably in recent years in ways that create a greater role for universities. There is now increasing emphasis on innovation as an 'open' process where firms use both internal and external sources of ideas, in a global search for the best talents and capabilities, and deploy multiple models to improve corporate performance [1]. This paradigm contrasts with the previously dominant 'closed' approach where firms relied on internal resources, and in particular the controlled environment of the corporate laboratory.

At the highest level of generalization, there are two principal routes whereby knowledge is transferred from a university to society. The first is through the annual wave of new bachelors, masters and doctors who move into employment and may carry with them new general concepts and approaches developed in the university setting and the intellectual and interpersonal skills to apply them. The second is through the interactions of private enterprises with the university research base, either by transmission of codified knowledge present in a particular research area or by exploitation of new knowledge developed in the university. Although the proportion of the population that have received a higher education, the level of that education, and the willingness of employers to increase the competence level of their workforce will determine the impact of the former, our principal concern is with the latter, where we need to understand the pathways most likely to yield public benefit. Those benefits are broadly in the social, cultural and economic domains.

The European Commission's recent communication on the modernization agenda for universities [2] recognizes their crucial importance for the future of Europe, and correctly identifies many of the structural weaknesses that must be addressed if "renaissance rather than decay" is to be their fate [3]. Although most of the power to reinvigorate them lies in the hands of national governments, the European dimension could also be a source of strength if effectively mobilized. A crucial part of the challenge is to make universities more effective partners for business in stimulating and enabling innovation.

There is an implicit assumption in many of the initiatives taken by German government or by individual universities, that the latter's most effective contribution to innovation is based on discoveries in university laboratories, followed by disclosure, patenting and licensing of the technology, leading to the creation of technology-based enterprises, often by the inventors themselves. Whilst there are several highprofile examples of the success of this route, this is not the only route, nor does it account for the largest proportion of university impact on innovation. The vast majority of university patents yield no royalty income whatsoever.

German universities that are perceived as beacons of international research, scholastic and innovative excellence and effectiveness have complete or considerable autonomy from the state. This permits them rapidly to re-shape their research efforts, their teaching programmes, their contributions to innovation and their employment policies without perennially seeking governmental approval or political sanction for detailed processes and itemized budgets. Without autonomy, university systems are unlikely to realize their potential for their societies. Government should set broad strategic priorities and require accountability for quality, efficiency and research and teaching targets, but leave the processes of governance, organization and direction to the institutions.

In Germany public and private needs for research, by business or others, and many of the great fundamental research challenges, increasingly demand cross-disciplinary collaboration. The classical, broadly-based research intensive universities, with their unrivalled breadth of research capability, are not only uniquely placed to exploit new cross-disciplinary challenges in basic research, but also uniquely placed to respond to business demands for solutions in inherently cross-disciplinary areas such as energy, materials and public policy. Many have been highly creative in doing so, with imaginative and productive re-configurations of their diverse research efforts. Much remains to be done however. Change requires effective and professional university leadership able to stimulate and manage greater dynamism, the autonomy rapidly and flexibly to promote and implement change, patterns of research funding that do not discriminate against cross-disciplinarity, and the capacity to create and exploit networks of institutions.

In German environment it is vital that iterative interactions between business and universities are stimulated. The challenge and opportunity for business (this is particularly true in the service sector) is to upgrade the business model through combinations of product design, service, system and distribution improvements. There is rarely a “eureka” moment when a dramatically novel concept suddenly enhances the business opportunity. Bringing perspectives and knowledge pools together interactively and iteratively creates the concept and the practical opportunity for innovative advance. Many universities, businesses and several national governments have been highly creative in developing schemes designed to enhance these interactions. We stress however that the business demand for research and enthusiasm for interaction is unlikely to increase as a consequence of governmental exhortation.

The processes attempt to improve the effectiveness of knowledge exchange activities between the business and universities through incentives and improved effectiveness of interface-spanning mechanisms and institutions. They particularly concentrate on the many market failures and shortfalls in competence that limit the interaction of the supply and demand sides of the innovation process:

- there is a lack of skill and competence at the collaboration interface (the ‘interface-spanning’ function), this includes technology transfer and knowledge exchange specialists;
- there is often a failure to recognize that informal knowledge exchange processes (networks, interactions, graduating students) are frequently the most effective means of knowledge exchange between universities and business. These informal mechanisms must be supported by formal mechanisms such as patents, licensing and publishing;
- the incentive structures in universities are different to those of business and this can hamper the knowledge exchange process. Processes that facilitate greater personnel exchange in both directions are needed;
- time frames are different. Business generally seeks quicker, commercially effective results compared to universities.

Thereby actions are required at the state and university levels in three principal areas: in improving the supply-side attributes of universities that optimize their contribution to innovation; in stimulating business demand for university engagement; and in improving the processes of interaction between universities and business. These should be the headline

issues for Ukrainian government in the field of educational policy.

Thus the state should:

- increase the autonomy of institutions in ways that will permit them to act in a more flexible and dynamic fashion, but which retain accountability for the use of public funds;
- recognize the vital need for appropriate diversity in their higher education systems and encourage its development through appropriate funding mechanisms;
- seek to enhance inter-disciplinary research through prioritization in research funding processes and programmes designed to address major technological issues likely to be of major importance to industry;
- set up processes to more effectively harness the research base in support of the fast growing service industries;
- seriously address the issue of university funding in a vital area of the modern economy, either through additional state or personal revenue or/and through the mechanisms of local engagement;
- continue to explore and fund, in association with business, processes that enhance interaction between universities and business that are relevant to the operation and structure of the economy.

Individual universities should:

- realistically analyze where their own strengths lie and where they might best achieve excellence and economic and social relevance;
- understand, engage and promote the optimal economic strategy for their region, and understand how their own particular strengths can best be mobilized to support regional and national economic development;
- ensure that academic and departmental structures and their flexibility enhance and do not impede cross-disciplinary efforts;
- ensure that their processes of selecting university leaders and governance mechanisms are well designed to identify and pursue broad institutional goals in their areas of strength whilst encouraging the academic freedom that is the university's greatest potential strength;
- continue to develop interaction processes in collaboration with business, and in particular to create processes that recognize their potential in business transformation processes in relation to their particular strengths.

References:

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