The Triple Helix, Open Innovation and the DOI Research Agenda

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Abstract

This paper examines the implications for research into the diffusion of innovations (DOI) arising from a growing body of literature in two related fields. The first area concerns the debate on the role of regional and national systems of innovation (NSI) in the innovation process. The second area deals with the argument that enterprises must move from a "closed innovation" to an "open innovation" paradigm. The review is presented in the context of a case study being undertaken in a subsidiary of American Power Conversion (APC) located in the West of Ireland. Based on the preliminary stages of our work, we present a conceptual 3-D model of Rogers' innovation-decision process and suggest a series of propositions to stimulate future research efforts.

INTRODUCTION

Over the last decade, significant literature has emerged in two areas related to innovation: firstly with the debate on the role and composition of national systems of innovation (NSI) and secondly with the argument that enterprises must move from a "closed innovation to an "open innovation" paradigm. The aim of this paper is to examine the consequences of this literature for research on the diffusion of innovations (DOI) and in particular on Rogers' work on the innovation-development process. The paper is presented in the context of a case study in a subsidiary of American Power Conversion (APC) located in Ireland's Border, Midland and Western (BMW) region. The paper proceeds as follows. Firstly the research context is outlined in terms of the evolving Irish economy and the regional situation. A brief literature review is then presented of enterprise innovation models and of national systems innovation (NSI). The next section provides an overview of an ongoing longitudinal case study on innovation being carried out in APC. Following this, a perspective is presented that realigns Rogers' two-dimensional (2-D) innovation process to a more externally focused three-dimensional (3-D) model. Finally, based on the context and literature, we propose a revised DOI research agenda together with suggestions for future work.

1 BACKGROUND

Over the last forty years, Ireland has leapfrogged from a traditional agrarian economy to a deliberately created information economy (Trauth, 2000). The initial impetus was fuelled by foreign direct investment (FDI) from North American multi-national corporations (MNCs) setting up offshore manufacturing facilities to avail of tax incentives, a young educated workforce and proximity to their growing number of European customers. However, this initially successful model is increasingly being threatened by the low cost economies of Eastern Europe, India and China. Irish enterprises rapidly need to build new sources of competitive advantage to sustain employment and standards of living. The Border, Midland and Western (BMW) region of Ireland is designated by the European Union (EU) as "Objective 1": a less well developed area that qualifies for additional structural funds under the EU state aid scheme. It is also one of the fastest growing regions of Europe but needs to increase absorptive capacity. Ireland is now entering a new era which, according to Porter (2003), requires a transition to an innovation economy

2 CHANGING INNOVATION PARADIGMS

The innovation-development process as defined by Rogers (2003 p 138) consists of the six steps shown in Figure 1. The methodology includes "all the decisions, activities and their impact" from the initial recognition of a need; followed by research, development and commercialisation through to diffusion and evaluation of the consequences.

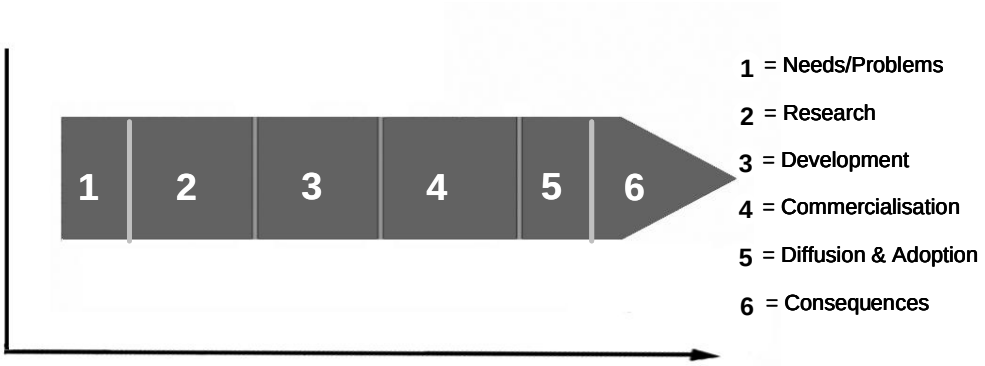

Fig. 1: *Rogers' Innovation-Decision Process adapted (2003 p 138)*

Recently, Chesbrough (2003) argues that in many industries, the centralised approach to R&D described above, which he terms "closed innovation" has become obsolete. This paradigm, he contents, must be replaced by "open innovation" which adopts external ideas and knowledge in conjunction with the internal process. A number of factors are influencing this change such as: the mobility of skilled people, the increasing presence of venture capital, emergent high-tech start-ups and the significant role of university research. The increasingly important role of academia in supporting innovation in knowledge-based societies has led to the development of a number of models from national systems of innovation (NSI) (Lundvall, 1995) to the more recent Triple Helix model of university-industry-government relations (Etzkowitz & Leydesdorf, 2000). The latter is illustrated in Figure 2 which had been adapted to emphasise the focal "area of interaction"; highlighted in the Venn diagram.

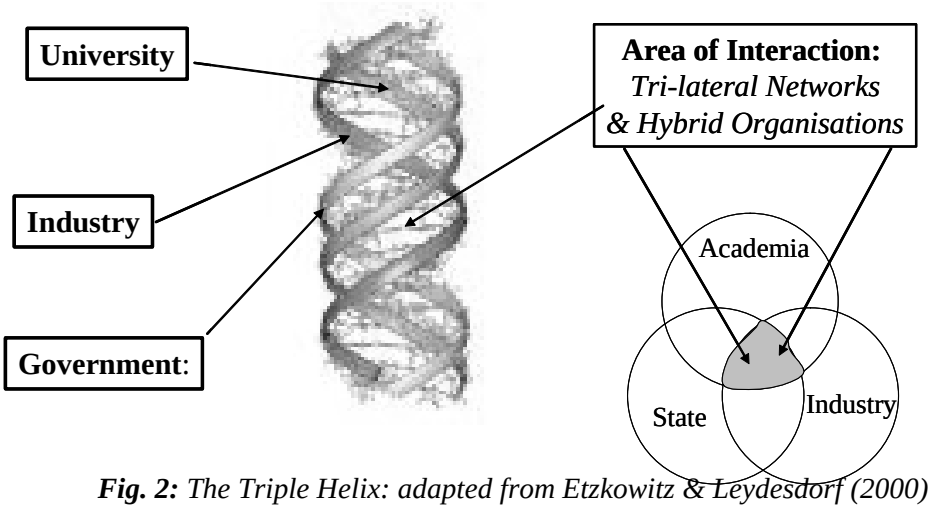

Fig. 2: *The Triple Helix: adapted from Etzkowitz & Leydesdorf (2000)*

However, while the reality of the growing association between academia and enterprises is widely accepted, the nature of the involvement is still a matter of lively debate Manimala (1997 p 111).

3 CASE STUDY

The case study is based in APC Ireland, a subsidiary of the American Power Conversion (APC) Corporation. APC designs, manufactures and markets back-up products and services that protect hardware and data from power disturbances. The explosive growth of the Internet has resulted in the company broadening its product offerings from uninterruptible power supplies (UPS) to the high-end InfraStruXure™ architecture in order to meet the critical availability requirements of internet service providers (ISP) and data-centres. This phenomenon has resulted in a value chain re-alignment from selling product or services to providing integrated customer solutions, typical of many ICT Corporations in knowledge-based economies (Grimes, 2003). APC entered a major period of transition in the second-half of 2006 with the announcement of its merger with Schneider Electric.

4 IMPLICATIONS FOR THE "DOI" RESEARCH AGENDA

Figure 3 illustrates the conceptual model of a three dimensional (3-D) innovation process that re-aligns the 2-D model of Figure 1 to include the dynamics of the Triple Helix. Using this perspective, we contend that organisations with "closed" innovation processes need to accommodate the dimensions of "open" innovation and engage with other significant regional actors.

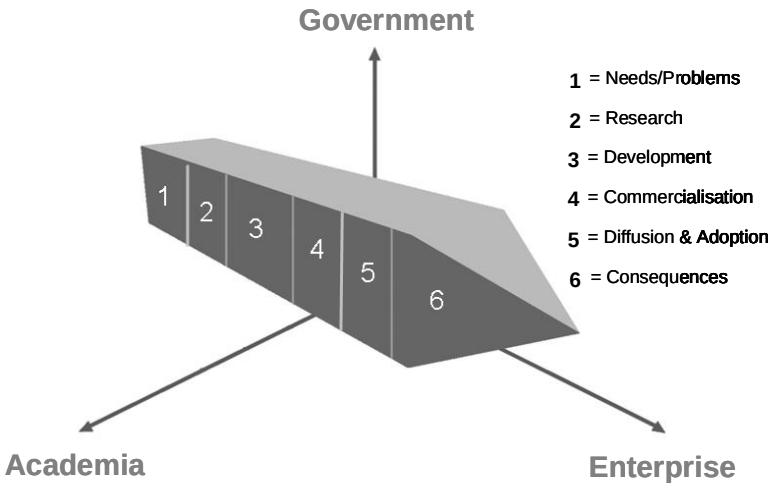

Fig.3: *3-D representation of Rogers' innovation-decision process*

Having illustrated our argument that Rogers diffusion theory needs to be updated based on the current debates on the concepts and structures of "National Systems of Innovation" and "Open Innovation" models, we will now discuss the implications for research.

4.1 Issues for the Research Agenda

A research agenda provides the impetus for planning and developing more detailed studies of a particular area. Arising from our previous discussion, we now propose the examination of the following issues that could contribute to refreshing the DOI research agenda:

1. Issues associated with Regional innovation.
2. Issues associated with the innovation process within "open" organisations.
3. Issues associated with developing more integrated and interactive collaboration between a Region and its organizations.
4. Issues associated with management of the innovation process in a 3-D reference frame.

4.2 Suggestions for Future Work

Arising from the issues presented above, we suggest a number of topics to stimulate future work:

1. Developing a Triple Helix model of, for example the BMW region, showing the main actors, roles and areas of interaction.
2. Examining the phases and deliverables of current "closed" innovation methodologies in the light of the "open innovation" paradigm.
3. Identifying the main areas of interaction between the Regional model and the Organisational innovation process with a view to more productive collaboration. We also raise the question whether each of Rogers six steps needs its own "Triple Helix".
4. Exploring the implications for innovation project and portfolio management arising from the 3-D perspective. Associated with this, investigating the consequences of moving from product and service innovation to "solutions" innovation.

5 CONCLUSIONS

This paper has provided a review of Rogers' innovation-development process in the light of a movement to "open" innovation within the Triple Helix of academia-enterprise-government. Following a review of the literature and the regional context, a conceptual model of a three dimensional (3-D) innovation process that re-aligns the current 2-D model to include the dynamics of the Triple Helix was illustrated. The paper argued that Rogers' innovation process needs to be updated to take into account these paradigms. Future work was suggested for a more detailed investigation of the implications of this perspective on the integration of regional and organisational innovation structures and methodologies.

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