

KNOWLEDGE BASED ECONOMY: Role of IPR¹

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The below quote by Rabindranath Tagoreⁱ appropriately sets the tone for the quest for dominance in the Knowledge Based Economy.

“Where the mind is without fear and the head held high;
Where knowledge is free;
Where the world has not been broken up into fragments by narrow domestic walls;
Where words come out from the depth of truth;
Where tireless striving stretches its arms towards perfection;
Where the clear stream of reason has not lost its way into the dreary desert sand of dead habit;
Where the mind is led forward by thee into ever-widening thought and action;
Into that heaven of freedom, my Father, let my country awake.”ⁱⁱ

The 1900s was dominated by the advent of machine tools, firearms, clocks, sewing machines, hardware, agricultural implements, bicycles, steel, electrification and telegraphy/telephony. In the early 2000s, economies of nations were driven by the onset of microelectronics, biotechnology, new materials, science industries, telecommunications, computers, numerically controlled machine tools, robots, civilian aircraft manufacturing and computers (hardware and software). Moving towards the 2030s, it is expected that nanotechnology, biomimicry, biomaterials, bioelectronics, biocomputing, artificial intelligence, knowledge management, planetary management and green power technologies would fuel economic growth.ⁱⁱⁱ

Where are we going? From an agricultural economy where land, labour and natural resources dictated the wealth of individuals and states to an industrial economy where the possession of capital and machinery and its effective management were wealth creators, we are entering the knowledge based economy which is dominated by science & technology, innovation and entrepreneurship.^{iv}

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The term ‘knowledge-based economy’ was coined by the OECD^v in 1996 and defined as an economy which is ‘directly based on the production, distribution and use of knowledge and information’.

A knowledge based economy is one where ideas and technologies are ingredients; intellectual property is the merchandise; people expect smarter products with more convenience and technology leaders fuel the innovation.

Realizing the potential of knowledge economy requires economic, institutional and regulatory environment that fosters the acquisition, development and use of knowledge; an education system that supplies citizens with the ability to create and use knowledge, a dynamic information infrastructure, innovation systems and networks.^{vi}

In the globalising knowledge based economy, research and innovation are the twin engines of competitiveness, the catalyst for economic growth, the road to efficiency, competitiveness, high-tech FDI, new companies and jobs.^{vii} It is only when the basic foundations for research & development are in place would innovation that provides for competitiveness and sustains economic growth, come forth.

Innovation is widely seen as one of the defining characteristics of a knowledge-based economy. Innovation is not a ‘big bang’, it occurs in wider networks of organisations that actively seek to learn from one another, share specialised infrastructure, business intelligence, labour markets and services and engage in mutually beneficial technology transfers. These inter-firm and inter-industry collaborations (represented in industry supply chains, networks and clusters) are not technology-dependent but new technologies have accelerated their development and their value.^{viii}

There is a strong link between investment in the research and innovation base of the economy and sustained economic growth. The accumulation of ‘knowledge capital’ will facilitate the evolution of the ‘knowledge-based’ economy.^{ix}

Knowledge is the most powerful engine of production.^x The extraordinary progress in information and communications technology, coupled with the increased speed of scientific, technological advance and global competition along with changing demand is the reason why knowledge is becoming more important.^{xi}

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It important to be a part of the knowledge based economy because information and knowledge are replacing capital and energy as primary wealth-creating assets. Knowledge is embedded in globalisation which is driven by pervasive ICT and internet use, deregulation and opening of markets as well as global trade expansion. The “new economy” enjoys simultaneously low inflation and low unemployment (unfathomable in orthodox economics), rising wages, disappearing budget deficits resulting in higher productivity and growth, increasingly attributable to IT sector.^{xii}

Research suggests that national innovative capacity is as important as internal technological capability in achieving competitiveness.^{xiii} There needs to be a national innovative system comprising social partnership which compliments enterprise level partnership. Investment attraction should aim at creating clusters and networks providing regional and spatial strategies for competitiveness wherein research and education results in tangible technology transfer.

Competing in the knowledge based economy requires a knowledge management framework.^{xiv} The framework would facilitate knowledge discovery by intelligence and environmental scanning, help in removing information overload and in taking better, faster, consistent and more informed decisions wherein competition would be based on smart decisions. Nurturing, supporting and managing ideas and creativity would result in innovative products.

Fostering support teams and communities to share knowledge with customers and partners is essential to help mobilise competencies and resources. The knowledge management framework would bring information transparency across the enterprise aiding competition based on the strength of world class performance utilising intellectual assets.

The ultimate objective is to build a knowledge-based society and economy, i.e. a society/economy endowed with the ability and capacity to generate and capture new knowledge and to access, absorb, share and use efficiently information, knowledge, data, communications and best practises.^{xv}

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IPR can play an important role in the knowledge-based economy, as they can encourage technology trade, and related patterns of specialization and increasing returns in technology development at the industry level, leading to greater diffusion of technology, and reducing the transaction costs in technology trading.^{xvi} While innovation may occur without IP protection, its pace and depth may be adversely affected without such protection.^{xvii}

Continuously evolving technologies bring about the ease of sharing information, developing new protocols and procedures and finding equivalence bringing about the need for protection of knowledge. IPR registration offer protection that is essential in the global market for knowledge and innovation where ability to create and sustain global networks is a key driver in successful organisations.^{xviii}

The importance of IP and its protection is amplified using a case study^{xix} based on the Philips^{xx} experience. Before 1985, Philips's business model was based on investments on R&D, the resultant R&D outputs were converted to products that were manufactured, marketed and sold resulting in return on investments.

Globalisation changes in the last 20 years both in marketing and manufacturing such as more companies, more competition, lower margins, shorter product life cycles, increased price erosion, cost of R&D increasing made the return on R&D investments more difficult for Philips.

Originally manufacturing created competitive edge, market leaders were entities who could mass produce or miniaturise products. Now manufacturing has become a commodity wherein companies outsource the manufacture of their own products to low wage countries. Thus the competitive edge of companies shifts from production based to knowledge based.

Further, in the last 20 years IPR laws and enforcement have substantially strengthened the key milestones where the advent of TRIPS seeks to harmonise patent laws around the world, the establishment of a single patent appeal court in the US has created a pro-patent climate, and the basic areas of patenting are being broadened day by day. This made IPR a strategic weapon in competition for Philips.

Philips which has been in business for over 100 years is credited with some significant patents like the medical X-ray tube (1918), neon tube (1922), audio cassette tape (1963),

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VCR (1971), Audio CD (1983), GSM speech (de-) coder (1985), DVD (1996), CD-R, CD-RW (1997), Blue-ray disc (2002) and scores of other patents and inventions.

Philips's patent filings which were around 877 in the year 1993 increased to around 3144 in the year 2002. Philips's current IPR portfolio boasts of about 95,000 patents based on 19,000 inventions with approximately 3000 new filings per year. Philips also owns more than 2,000 domain names in addition to the 22,000 trademarks and 6000 designs.

Philips's successful transition from the manufacturing era to the knowledge based era was a result of its recognition of importance of IP and its protection.

Reference:

- ⁱ The Nobel Prize for literature was awarded to Rabindranath Tagore for his Gitanjali in 1913.
- ⁱⁱ From the collection of prose translations 'Gitanjali' or 'song offerings' by Rabindranath Tagore.
- ⁱⁱⁱ Presentation made by Michael M. Crow, Executive Vice Provost of the University, Professor of Science and Technology Policy, Columbia University, during the Seminar 'Universities and Socioeconomic Advance - organizing principles for strategically realigning American regional research universities'.
- ^{iv} National Innovation Systems by R.M.P. Jawahar, TREC-STEP, India 2002.
- ^v OECD: Organisation for Economic Co-operation and Development (OECD) groups 30 member countries sharing a commitment to democratic government and the market economy. With active relationships with some 70 other countries, NGOs and civil society, it has a global reach. Best known for its publications and its statistics, its work covers economic and social issues from macroeconomics, to trade, education, development and science and innovation.
- ^{vi} Knowledge Economy Development – The World Bank Perspective, Severin Kodderitzsch, Europe and Central Asia Region, The World Bank.
- ^{vii} National Strategy for Research, Technological Development & Innovation 2003-2006, Proposal to Cabinet July 2003, Malta Council for Science and Technology (MCST), Villa Bighi, Bighi, Kalkara CSP 12, Malta.
- ^{viii} Vocational education and training as an innovation system - fad or frontier? Kaye Schofield, Presentation to TAFE frontiers: Flexible Learning Week Conference Tuesday 19th August, 2003.
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- ^x Alfred Marshall, Principles of Economics, London: Macmillan and Co., Ltd., 1890.
- ^{xi} *Supra Note v*
- ^{xii} Information and Communications Technologies (ICT) and Developing Countries - Towards a Knowledge-based Economy, Presentation at International Symposium on Information Technology and Development Cooperation by Hans d'Orville, Director, IT for Development Programme/UNDP, Tokyo, 3 July 2000.
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- ^{xiv} Knowledge Management Tools, Techniques and Learning, Marc Auckland, Chief Learning Officer & Head of the British Telecommunications Academy.
- ^{xv} *Supra Note xiv*.
- ^{xvi} Intellectual Property Rights and the Market for Technology, Alfonso Gambardella, University of Urbino, February 3, 2000.
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- ^{xviii} The role of the Statistician in the Knowledge Based Economy, IAOS Conference, August 2002, Geoff Carss, Principal, Knowledge Management, Public Sector Practice, IBM Global Services.
- ^{xix} Adapted from the presentation "Philips, IPR and software" by Leo Steenbeek, European Commission DG INFSO stagiaires Workshop, Brussels, July 8, 2003.

^{xx} Royal Philips Electronics is one of the world's biggest electronics companies and Europe's largest with sales of €29 billion in 2003. One of the world's major private research organizations, Philips Research creates technologies that improve people's lives. <http://www.philips.com>

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