

Passages from Organisational Knowledge to Innovation: New Economy Dynamics, Intangible Assets and Organisational Design

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Abstract.

This paper is concerned with the identification of the organisational structures and processes that enable the conversion of intangible corporate assets, and more specifically organisational knowledge into value. The paper develops a framework of analysis of the dialectical relationship between the organisational structure and capabilities of firms and the competitive environment within which they operate in order to identify the key factors of corporate competitiveness. The nodal concept of this framework is ‘organisational capital’ which denotes synergistic processes between 1) corporate alignment around the technological and financial dynamics of the new economy, 2) the management of intangibles and knowledge-based assets, and 3) their deployment for innovation and value creation. The framework is structured around three dimensions. The first advances an analysis of the pattern of economic change associated with the transition to the new knowledge-driven economy with specific attention to the interaction between technological and financial change. The second dimension concentrates on the changing patterns of economic valuation with specific emphasis on the growing strategic importance of the intangible assets of organisations, in particular organisational knowledge-creating capabilities. The third dimension develops an analysis of the dynamics of organisational design with particular attention to the ‘network enterprise’ and learning processes within knowledge-generating organizations.

Keywords: organisational capital, global finance, information technology, organisational knowledge, the network enterprise.

Introduction

Information and communication technology (ICT) is today recognized as the epicentre of a profound economic dislocation associated with what has come to be known as the transition to the new knowledge-driven economy. The fundamental feature of this transition is the alteration of the economic parameters of value creation. This involves a shift in the valorisation process that prioritises the value of the intangible assets of organisations, particularly their organisational capabilities for innovation. One such key asset is ‘organisational capital’. Relatively under-explored but seemingly highly valued in global capital markets, organisational capital refers to organisational knowledge-creating capabilities of firms and their deployment for innovation in product, service and process for the creation of value.

In the new knowledge-driven economy, the ability to innovate has emerged as the critical competitive weapon. Innovation has emerged as a strategic issue because of the disarticulation of established economic and social structures and processes that the

new economy and the new society bring in their path. This disarticulation is the product of the interplay of technological, industrial, economic and social transformations. The alignment and re-articulation of technological capabilities, especially ICT, through novel knowledge-creating organisational elements geared to constant innovation and value creation is the intangible quality that today determines the competitiveness of economic organisations and the national and regional environments within which they operate. Thus, it is not knowledge *per se* that commands strategic attention but rather the technological and organisational conditions that allow for the creation of new knowledge and its conversion into innovation and economic performance.

Structural Features of the New Economy: at the interface of information technology and global finance

Much recent analysis of the new economy has tended to focus on the dot.com phenomenon and the unrealistic valuations of Internet-based firms. Indeed, conventional received opinion continues to concentrate on e-business with an almost exclusive emphasis on the online portions of business processes and economic activity. However, to associate e-business and the commercialisation of the Internet with the new economy is not only misleading but can also be risky for corporate performance. For it fails to take into account the fact that the new economy involves a passage to a set of structural conditions that are of fundamental importance in shaping the competitive environment within which firms operate.

E-business is not an economic activity conducted through computer-enabled electronic networks. E-business is a central component of a new economic system that is powered by ICT, is dependent on highly knowledgeable labour, and is organized around electronic and organisational networks. The historical specificity of this new economic system is that it is *knowledge-driven*, it is *global* and it is *networked* in terms of technology and organisation. It is *knowledge-driven* because the productivity and competitiveness of economic units depend upon their ability to create, process and convert information into knowledge geared to innovation and value creation. It is *global* because the core processes of production, consumption, and circulation are organised on a global scale through functional linkages among economic agents. It is *networked* because productivity and competition are organised through a global network of interaction between and across business networks.¹ It must be emphasised that the novelty of this system does not involve the absence of business cycles or economic laws. Instead, its novelty is that it alters the modalities of their operation while introducing new rules into the economic process, rules such as network effects and accelerated cycles from conception to market.

The origins of the new economy lie in the last quarter of the twentieth century. More specifically, the new economy is closely linked with two key industries that not only introduced process and product/service innovations, but also applied such innovations to their own structures and processes, which resulted in higher growth and productivity, and through competition, to the diffusion of new business models

¹ Manuel Castells, *The Information Age: Economy, society and Culture*. Volume I: *The Rise of the Network Society*, Volume II: *The Power of Identity*, Volume III: *End of Millennium*, Oxford 2000.

throughout the economy. These industries are *information and communication technology* and *finance*. At the core of the new ICT industries are the Internet-centred firms and Internet-related components of ‘old economy’ types of organisations. However, the centrality of Internet-related economic activity is not related to the until-recently exponential revenue growth and market capitalisation value of Internet-related firms. Instead, their economic and business significance lies with the potentially dramatic impact of Internet-related technologies on the way business, especially ‘old economy’ business, is conducted.²

The financial component of the new economy is related to the successive rounds of innovation that have resulted in a profound transformation of financial markets both organisationally and technologically. Financial markets are increasingly globalised and interdependent while they are one of the leading domains of application of new ICT. The global financial market is a central component of the new economy. The ability of capital to flow in and out of securities and currencies across markets, and the hybrid nature of financial derivatives, are intertwining at an accelerated pace through regulatory changes. At the same time, ICT-enabled innovation is transforming the nature of financial transactions. The widespread use of ICT and the Internet has revolutionized financial trade between firms, between investors and firms, between sellers and buyers, and ultimately, the stock exchange markets. The technology of transactions has implications not only for financial markets but also for the entire economy. ICT-enabled transaction mechanisms reduce transaction costs, thus significantly increasing market volume because the market becomes able to mobilize savings from anywhere to be invested anywhere, while accelerating the turnover of investment. On the other hand, they open up investment opportunities to an increasingly larger pool of investors who are able to assess value and seize opportunities on the basis of online information. They also present the possibility of financial disintermediation, as individual investors and online brokers bypass traditional brokers and investment firms.³

The dialectical interplay between technology and finance is in many ways the central axis, the *flywheel*, that powers the dynamism and innovation potential of the new economy. On the one hand, the technological infrastructure of financial markets allows for processes of financial innovation and the development of new financial products that create value out of trade in securities. On the other, ICT-enabled financial innovation encompasses an increasingly larger sphere of social life where almost any potential source of value can be converted into a security and traded in financial markets through ICT-enabled transaction systems. Indeed, this process of conversion of potential sources of value into financial securities, i.e., securitisation, is the driving force of the financial industry. Financial markets, in this respect, constitute a strategic network of the new economy. For it is there that value is assigned to economic activity as represented by its stocks, bonds, derivatives or any kind of

² Manuel Castells, *The Information Age: Economy, Society and Culture*. Volume I: *The Rise of the Network Society*, Oxford 2000, Frances Cairncross, *The Company of the Future: meeting the management challenges of the communications revolution*, London 2002.

³ Jordi Canals, *Universal Banking: International Comparisons and Theoretical Perspectives*. Oxford, 1997, George Soros, *The Crisis of Global Capitalism: Open Society Endangered*, New York 1998, André Orléan, *Le Pouvoir de la Finance*, Paris 1999.

security. The valuation of companies, and thus their capacity to attract capital, depends in a fundamental sense on the judgment of the financial market.⁴

The question of how this judgment is formed is one of the most complex questions in contemporary economic analysis and is the subject of considerable debate. Nevertheless, recent research suggests that *expectations* (on the part of financial markets) about the future growth projections of firms and *trust in the institutional environment* within which firms operate are central determinants of investment in the new economy. To put it differently, in the new economy real-world economic calculations that govern investment decisions are made not on the basis of the actual profitability of firms but on the basis of the expected growth of their financial value.⁵

However, to reach the financial market, and to compete for higher value in it, firms have to go through innovation in processes, product/services, management quality, and branding. Indeed, the ability to innovate in these domains becomes a key competitive weapon.⁶ But the key to innovation lies in creative thinking and the identification of value-creating opportunities. It is leveraging these opportunities that leads to value creation. Indeed, today the connection between organisational knowledge and innovation has become so critical that many companies consider organisational knowledge, combined with continuously improving information and communication channels, as risk management. The reason is that sharing and transferring knowledge within an organisation and across organisations enables companies to increase operational and organisational transparency, which in turn helps to reduce risk. In other words, organisational knowledge is about access to information, the conversion of information into knowledge through open channels of communication, which combine to provide good judgment on the performance of a firm.⁷

However, paths toward innovation are conditioned by three structural transformations associated with the new economy that have significant implications for the organisational structure of the firms operating in it. First, ICT centred on the Internet, in combination with globally integrated financial markets, tend to overcome one of the historic impediments to market transparency: geographical distance.⁸ Transparency is a highly transforming condition that affects two dimensions of the business process. ICT increase transparency in the operation of financial markets. Openness of corporations to financial markets is primarily a function of the financial disclosure regulations that govern public trading, i.e., access to capital markets. Information technologies increase transparency in that they enhance the ability of shareholders to track more intensely the performance of managers and align it more closely toward maximising shareholder value. Within corporations this is reflected in a shift in the structure of accountability that is particularly visible in the development

⁴ Manuel Castells, *The Information Age: Economy, Society and Culture*. Volume I, Oxford 2000.

⁵ Manuel Castells, *The Internet Galaxy: Reflections on the Internet, Business and Society*. Oxford: Oxford University Press 2001.

⁶ Ilkka Tuomi, *Corporate Knowledge: Theory and Practice of Intelligent Organizations*, Helsinki 1994., Stephen M. Shapiro, *24/7 Innovation: A blueprint for surviving and thriving in an age of change*. New York: McGraw Hill 2002.

⁷ Lucia Dore, *Winning Through Knowledge: How to Succeed in the Knowledge Economy*, Special Report by the *Financial World*, The Chartered Institute of Bankers in Association with Xerox. London: March 2001.

⁸ David Harvey, *The Condition of Postmodernity*. Oxford: Oxford University Press 1990.

of e-business strategies. Historically, decision-making regarding technology had been the domain of chief information officers (CIOs) and operation managers. Research suggests that, by contrast, in the new economy – especially since the last quarter of the twentieth century – it is chief financial officers (CFOs) and controllers of corporations that are increasingly driving key Internet-related decisions such as the development of e-business strategies. The reason for this has to do with value at risk analysis that stresses that e-business is a critical component of competitiveness. Since the fiduciary obligation to enhance value lies with CFOs it is they that are driving key Internet-related decisions.⁹

On the other hand, ICT increase price and process transparency. Pricing becomes more transparent as more transactions can be put to the test of auction. Customers can track the progress of their orders while suppliers can get information electronically out of their customers' databases. This kind of transparency affects every aspect of business. Small changes in things such as price, product quality, service, responsiveness, and even partnerships could, in theory, be rapidly registered in market share shifts. Putting a business process online has effects throughout a company, since it introduces more information and volatility into strategy. As a result, partnerships and customer relations that underpin existing business models are being reconfigured. In reality, excepting financial markets where they are negligible, switching costs for most industries still represent a significant element of friction. Nonetheless, the Internet contains the potential to move most industries closer to textbook transparency. As a recent authoritative report notes, the Internet is “the mother of all looking glasses”.¹⁰

The second implication of the new economy acts on the level of the spatial organisation of firms. As information technology and the Internet become entrenched into corporate life, the economic foundation of the firm changes. Business theory on the spatial configuration of the firm has argued that the boundaries of firms are determined by the cost of transactions, and especially the cost of communication.¹¹ One of the central canons that guided business practice for much of the 20th century was that an enterprise should aim for maximum integration as a key to competitiveness and efficiency. In the new economy, by contrast, disintegration and decentralisation are becoming the new canon for competitiveness. There are primarily two reasons for this. The first is that the knowledge needed for any economic activity has become highly specialized which means that it is becoming increasingly expensive and complex to maintain the necessary competencies for every major task within any given organisation. And since knowledge is a quality that can be rapidly depleted unless it is used constantly, maintaining within an organisation an activity that is used only intermittently leads to incompetence. The second reason why disintegration and decentralisation are becoming important is that the physical cost of communication is becoming virtually nil which means that in order to organise efficiently firms must search for the most economically optimum form of organisation.¹² The reduction of the information costs attached to transactions, thus, unleashes a process of reconfiguration of the internal and external boundaries of firms. The reduction of information costs enhances organisational capacity to link

⁹ Goldman Sachs Investment Research, *E-Commerce/Internet: B2B: 2B or Not 2B*, November 1999.

¹⁰ Morgan Stanley Dean Witter, *The B2B Internet Report, Collaborative Research*, April 2000.

¹¹ Ronald H. Coase, “The nature of the firm”, *Economica*, 1937.

¹² Peter Drucker, “The next society: a survey of the near future” *The Economist*, November 3rd 2001.

different operations within and between firms and outsource critical business process components. An important implication of this is the acceleration of the cycle from conception to rollout. At the same time, new ideas and competition can spring up anywhere on the Internet which reinforces the need for companies to develop mechanisms for 'reading' and adjusting to the shifting conditions of competition. Within companies, the implication is a greater need for collaboration in order to maximize synergies and increase efficiencies across all lines of the business process.

The third implication of the new economy is that it introduces a dialectic of centralization/decentralization in companies. This is largely a function of software standards required in order to enable the transfer of information within and between companies with different software systems, naming conventions, procedural methodologies etc. At the same time, standardisation increases the capacity of all parties involved (management, employees, external partners) to 'see through' the entire process. Transparency, in other words, though it significantly enhances the influence of shareholders also increases the potential of other corporate stakeholders or partners to 'see through' a company's activities. More specifically, it enables management to contribute to the activities at the frontlines of the company's operations. On the other hand, in the context of the pattern of economic change and heightened competition companies need information at the frontlines of their operations. Hence the need for decentralised organizational forms that enhance the autonomy of employees not only in the generation of knowledge but also in terms of decision-making and action, in order to acquire knowledge of developments at the frontlines of their operations (i.e., the market touch-points with customers, suppliers etc.) and to constantly adjust to shifts in the competitive environment within which a company operates.¹³

The structural impact of this set of transformations is that the process of innovation is increasingly becoming a function of open-source networks of cooperation. In other words, innovation is not something that is happening 'inside' firms but rather at the interfaces of markets with the market, regulatory and institutional environments within which firms operate. Open-source networks are composed of teams of freelance individuals, company employees and entrepreneurs outside the official structures of companies as well as within such structures. Innovation itself is driven by three main factors. The first is the generation of new knowledge in the form of scientific and technological know-how and in the practice of management. This presupposes the existence of well-developed public and private R&D systems able to supply the fundamentals of innovation. The second is the availability of highly educated and motivated labour, capable of using new knowledge in innovative ways to increase productivity and value. The third factor is the existence of entrepreneurs, willing and able to take the necessary risks to transform business projects into innovation and improved business performance.¹⁴

The process of innovation in the new economy is the product of different balances of organisational forms and capabilities and managerial know-how that enable organisations to generate value. The open-source networked nature of the process of innovation involves three distinct elements. The first concerns the variety of the

¹³ Frances Cairncross, *The Company of the Future*, 2002.

¹⁴ Manuel Castells, *The Internet Galaxy*, 2001.

organisational forms that enable innovation. Organisational forms are of fundamental importance for innovation and the diverse ways it can manifest itself, e.g., as products, processes and systems/architecture. Within each of these forms, some innovations are more or less incremental or evolutionary, while others can be quite radical. The implication is that different kinds of innovation have different characteristics and require different managerial approaches to be successful.

The second element concerns the *complexity and differential temporal rhythms* of processes of innovation. Innovation is set in motion by multiple sources – ranging from organisational culture, knowledge and entrepreneurial attitude – develops through different stages and involves various feedback loops, linkages with both internal networks of managers and other professionals within firms and with external networks of key strategic clients, suppliers, other vendors (including potential outsourcing candidates), other third parties and a range of relevant knowledge-intensive institutions (e.g. professional services firms, research organizations and centres and universities).

The third element involved in innovation in the new economy concerns networks. In many ways the process of innovation is *a network process*, that is, a process that takes place between and across organizations in multiple and often overlapping organizational and institutional settings within diverse geographical environments. These institutional settings include entrepreneurial small firms, large corporations, providers of technology, and systems integrators. The diverse array of geographical and institutional environments includes the global level, national jurisdictions, regions and cities. Effective management of innovation in this context requires continuous balancing and leveraging resources among and across various geographical environments and institutional settings.

The Strategic Significance of Intangible Assets: organizational capital

It is this set of structural conditions that largely accounts for the ascending importance of intangible corporate assets in the process of value creation.¹⁵ The growing importance of intangible organisational assets can be appreciated in historical perspective. For much of the early 20th century multinational firms were domestic firms organised internationally on the basis of a structure of subsidiaries that were operating more or less autonomously within territorially defined institutional jurisdictions. During the closing decades of the 20th century multinationals tended to become increasingly organised on a global basis defined by product and service lines. More recently corporate strategies underpinning foreign investment are geared toward the development of structured relationships between companies operating in different sectors and institutional environments. In the emerging context, it is alliances, joint ventures know-how agreements and minority stakes that are becoming the critical components of innovation strategies. At the same time, the organisational topography of the operations of multinational firms spans a global institutional and regulatory matrix. This means that the critical tasks of management are becoming balancing acts of conflicting demands between short-term profitability and long-term strategic

¹⁵ Baruch Lev, *Intangibles: Management, Measurement, and Reporting*, Washington DC: Brookings Institution 2001.

growth made by the modern corporation's stakeholding constituencies: customers, shareholders, i.e., financial markets, especially institutional investors and pension funds, knowledge employees and communities.¹⁶

This is the field of 'organisational capital'. As was noted above, the transition to the new economy involves a shift in the parameters of the valorisation process which increases the value of the intangible assets of organisations and more specifically their 'organisational capital'. Successful management of 'organisational capital' depends on the knowledge –creating capabilities of organisations and the deployment of organisational knowledge for innovation and value creation. The correlation between knowledge and organisational change and adaptation is a function of the fact that in the new economy though investment in technology is important, it is innovation in processes, product and service lines that is the key determinant of market capitalisation.¹⁷

The term 'organisational capital' refers to a nodal concept that is composed of several subcategories of intangible capital. It encompasses, but is not restricted to, the following aspects of capital: market capital – not the physical qualities of the products produced by firms, but the knowledge that underpins the creation and development of new products and services and other elements related to products and services such as trademarks, patents, brand and corporate image etc.; intellectual capital, that is, the knowledge and skills that form the human resource base of an organization; structural capital, that is, the accumulated knowledge and innovation capabilities conferred onto an organisation by ICT, and internal organisational processes that give it competitive advantage in the production and distribution of products and services; relationship capital, that is, the company's relationship with its customers, suppliers and other constituencies such as investors, public authorities on national and regional levels; communications capital, that is, the ability to leverage and communicate organisational intangible assets in a way that positively influences analysts perceptions and recommendations and hence increased investor demand, company stock pricing and employee commitment.

The growth of the strategic importance of intangible assets can be understood as a shift that places increasingly higher value to the information assets, or more correctly, knowledge assets of corporations. The differentiation of *information* from *knowledge*, in this context, acquires strategic significance. The value of information generated by computer systems depends on human interpretation. Knowledge, by contrast, resides in a social inter-subjective context and the human capacity for action based on that information. Thus, knowledge in a corporate organisational context can be distinguished from information since it is more directly linked to action and organisational performance. Organisations, of course, cannot manage knowledge *per se*. They can, however, create an environment that fosters the continuity, creation, and sustained use and of knowledge and its application within the organisation.¹⁸

¹⁶ Peter Drucker "The next society: a survey of the near future", 2001.

¹⁷ Erik Brynjolfsson, Lorin M. Hitt and Shinkyu Yang, (2000), "Intangible Assets: How the Interaction of Companies and Organizational Structure affects Stock Market Valuations", MIT Working Paper, July at <http://ebusiness.mit.edu/erik/>

¹⁸ Yogesh Malhotra, "Knowledge Management for E-Business Performance: Advancing Information Strategy to Internet Time", *Information Strategy: The Executives Journal*, Vol. 16 2000.

One influential approach to the management of intangible corporate assets has proposed a model of the knowledge-creating company which is based on the organisational interaction between “explicit knowledge” and “tacit knowledge” at the source of innovation. This perspective argues that much of corporate knowledge is “tacit” and cannot be communicated under formalised management procedures. Yet a corporation’s potential for innovation is significantly enhanced when it is able to build bridges that allow the conversion of “tacit” into “explicit” knowledge, “explicit” into “tacit” knowledge, “tacit” into “tacit”, and “explicit” into “explicit”.¹⁹

This conversion can be facilitated through the use of ICT tools. However, the creation of a knowledge-creating organisation is not an issue of technology, it is an issue of organisation. More precisely, the creation of a knowledge-creating organisation is a question of creating process, that is, aligning technology, people, and organisational qualities toward specific organizational goals. And this is primarily a process that involves skills, competencies and commitment.²⁰ The new economy depends on the availability of highly knowledgeable and motivated workers able to navigate, both in terms of ICT and content, the vast plains of information and able to organise it and focus in order to transform it into knowledge for the tasks specific to the work process and the organisation’s strategy. These abilities demand continuous education and decision-making autonomy both of which have to do with a particular organisational structure and an organisational culture that instils commitment and encourages learning and autonomy.

Organisational Design: the ‘network enterprise’

Efficiently managing organisational capital depends in a fundamental sense on the development of organisational forms that generate mutually reinforcing dynamic interrelationships between ICT, organisational flexibility, and highly skilled and motivated labour.²¹ In the emerging economic environment timely access to information related to each market a company is operating in is critical for competitive success. However, such access in a constantly changing economic environment marked by highly diverse market dynamics is not feasible on the basis of inflexible and top-down organisational structures. Access to information at a specific space and a specific time is the crucial competitive factor. ICT allows for the simultaneous decentralisation of the information retrieval process from different spaces and for its integration into a flexible system. This technological structure spans different institutional and regulatory spaces which present the potential for large multinational firms to link with small and medium size enterprises according to contingent project demands forming networks that are able to innovate and adapt continuously. In this context, the actual operating unit of the economic process is no

¹⁹ Ikujiro Nonaka and Takeuchi Hirotaka *The Knowledge-creating Company*. New York 1994, Ikujiro Nonaka and Toshihiro Nishiguchi (eds.), *Knowledge Emergence: Social, Technical, and Evolutionary Dimensions of Knowledge Creation*. Oxford. 2001.

²⁰ Panagiotis Damaskopoulos and Ahmed Bounfour, “Managing Organisational Capital in the New Economy: Knowledge Management and Organisational Design” in Brian Stanford-Smith and Enrica Chiozza (eds.), *E-work and E-commerce: Novel Solutions and Practices for a Global Networked Economy*, Volume 1, Amsterdam: IOS Press 2001.

²¹ Timothy Bresnahan, Erik Brynjolfsson and Lorin Hitt, “Information technology, workplace organization, and the demand for skilled labor: firm-level evidence” Cambridge, MA: MIT-Sloan School Center for E-business, working paper.

longer the individual firm; it is the business project that is enacted by the open-source cooperation among networks. Business projects are implemented in diverse domains and can be directed to product and service line development and organisational tasks across different territorial areas. Successful business project implementation is a function of information that is generated and processed on the basis of ICT systems between and across companies, on the basis of knowledge acquired from each area. In other words, the key passages of information and knowledge that underpin the process of innovation run through networks: ICT and organisational networks within, between and across companies.²²

There is a particular organisational form that has emerged as a critical component of competitiveness in the new economy: the 'network enterprise'. In contrast to earlier vertically integrated hierarchical organisational structures, this is a flexible organisational form of economic activity, built around specific business projects and strategic objectives. The business projects themselves are set in motion through the cooperation of networks of various and flexible duration periods, diverse origins and compositions of skills and competencies. Indeed, such is the structural change associated with the transition to the new economy that the basic unit of economic activity and theoretical analysis is increasingly the network, not the firm. The firm continues, of course, to be the basic repository of property rights, strategic management and the accumulation of capital. However, business practice is increasingly a function of *ad hoc* networks whose expertise is solicited for the achievement of specific business project goals. In terms of its internal organisational structure the 'network enterprise' is characterized by several main trends: its organization is structured around process, not task, it has a flat organisational hierarchy, the work process is organised on the basis of teams, customer satisfaction is the primary measure of business performance, the structure of reward is based on team performance, the maximization of contacts with suppliers and customers is an integral part of the business process, and information, continuous training of employees at all levels are considered critical to business success.²³

Thus building a knowledge-intensive 'network enterprise' is not simply a matter of digitising existing business processes. It is a question of organisational structure and culture and how working communities within organizations collaborate, learn and transform their knowledge into innovation and value. Organisational learning involves a systemic process of building working communities that transcend the particular skills and knowledge particular individuals possess and internalise such knowledge in terms of routines and practices. One of the main challenges in building organisational learning capabilities and practices concerns the development of organisational cognitive systems or memories that preserve knowledge, once the individuals leave the organisation. This is not to say that people are less central to the process of organisational learning. For the sharing knowledge which is fundamental to the effective operation of networks implies inter-subjective understandings and shared contexts which are critical for the collection of the 'right' information, its organisation, its dissemination, its accessing, its conversion into knowledge and ultimately into innovation.²⁴

²² Manuel Castells, 2001.

²³ Manuel Castells, *The Information Age: Economy, Society and Culture*. Volume I, Oxford 2000.

²⁴ Skyrme, D.J., *Knowledge Networking: creating the collaborative enterprise*, Butterworth-Heinemann, Oxford 1999.

It is synergy among these networked organisational components and their interaction with the business, regulatory and institutional environment in which firms operate that decides the innovative capabilities and competitiveness of organizations in the new economy. ICT and the Internet have long been considered as bringing about 'the end of geography' since the transparency they introduce into the economic process makes location less important - organisations have access anywhere and any time. Yet, recent research demonstrates a remarkable geographical concentration of not only the production process of technologies that presumably annihilate geography but also the continuing concentration of significant ancillary services key to the new knowledge-driven economy, services ranging from finance to legal services and advertising. Why is this happening? Research shows that spatial concentration and geographical proximity continue to hold a fundamental importance in fostering innovation. Innovation, in other words, is not something happening 'inside' organisations but rather at the interface of organisations with the business, regulatory and institutional environment within which they operate.²⁵

A key element in this spatial concentration is the critical importance of technological innovation production complexes that function as fundamental sources of innovation. These complexes concern 'industrial clusters' or 'milieux of innovation' and denote the organisational and institutional matrices that underpin accelerated paces of technological uptake, organisational knowledge creation and their deployment for innovation. They incorporate specific sets of relationships of production and management, embedded in social and institutional structures that support a culture underpinned by an entrepreneurial attitude and encourage the development of new business processes geared to innovation. The central feature of the institutional infrastructure of these spatial concentrations is the synergistic relationships they foster among and across firms and institutions of the public sector. Typical components of a 'milieu' include companies that are networked within and through the milieu, public institutions such as boards of trade and dedicated investment-attracting and promotion agencies (necessary for the creation of a business-friendly environment), universities and research centres (necessary for the support of networked R&D activities and the generation of know-how and know-what). The key in the competitive position of 'milieux of innovation' is their capacity to generate synergy; that is, the added value resulting not from the cumulative effect of the elements present in the milieu but from their interaction.²⁶ Such is the centrality of this interaction in the process of innovation that the role of industrial 'milieux of innovation' has been singled out as a strategic area for investigation by key official organs of the global economy and the European Commission.²⁷

²⁵ Saskia Sassen, *The Global City: London, Tokyo, New York*, Princeton NJ: Princeton University Press 1991, Anna Lee Saxenian, *Regional Advantage*, Cambridge MA: Harvard University Press 1994, Andrew Leyshon and Nigel Thrift, *Money/Space: Geographies of Monetary Transformation*, London: Routledge 1997, Michael Porter, "Clusters and the New Economics of Competition", *Harvard Business Review*, November-December 1998. Alfonso Gambardella and Franco Malerba (eds.), *The Organisation of Economic Innovation in Europe*. Cambridge University Press 1999, Saskia Sassen, *Cities in a World Economy*, 2nd Edition, London: Pine Forge Press 2000.

²⁶ Manuel Castells and Peter Hall, *Technopoles of the World: The Making of Twenty-first Century Industrial Complexes*, London 1994.

²⁷ OECD, *A new Economy? The changing role of innovation in information technology in growth*, Paris 2000, European Commission, *Innovation policy in a knowledge-based economy*; Maastricht Economic Research Institute on Innovation and Technology 2000.

Conclusion

The economic dislocation associated with the transition to the new economy brings in its path a set of transformations that amount to a shift in the parameters of the process of value creation. This involves a shift that prioritises the intangible assets of corporations and specifically their ‘organisational capital’. Organizational capital entails organisational learning, that is the generation of knowledge and the combination of an ability to convert such knowledge into innovation through the development of novel organisational forms. Indeed, innovation has emerged as the critical competitive weapon in the new knowledge-driven economy. But innovation is increasingly moving to open-source networks of collaboration within and between companies and the business, regulatory and institutional environments within which companies function. It is the networked synergy among these elements, coupled to flexible and adaptable management philosophies, organisational structures and culture that decides the innovation capabilities and the competitiveness of firms, and by implication the competitiveness of regions, in the new economy. In other words, organisational capital involves more than knowledge. It involves the organisational and institutional capacity to translate organisational knowledge into new ways of doing business and generating value.

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