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The Role of Journalism in Innovation Systems

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The Role of Journalism in Innovation Systems

'Innovation Journalism' covers the technical, business, legal and political aspects of innovations and innovation systems. Competitiveness in innovation systems depends on the quality of interaction and shared knowledge between involved individuals and organizations. These entities include commercial, academic and political actors in different areas such as science, engineering, education, manufacturing, marketing and governance. The media represent major sources of shared knowledge, setting a standard for public discussion, influencing the agenda profoundly. So understanding the role of journalism in innovation systems is important. Journalists' understanding of the reported matters sets the baseline for public debate and quality of knowledge in society.

1 The Concept of Innovation Journalism

'Innovation Journalism'¹ is journalism about innovation, i.e. the market introduction of inventions, for example commercialization of emerging technologies. It is not 'innovative journalism,' which is about innovations in journalism. Innovation Journalism covers technical, business, legal and political aspects of innovations and innovation systems. Good Innovation Journalism enhances public debate by improving common knowledge and understanding of innovation issues, essential for society. In industrial economies, innovation is crucial. In democracies, journalism is essential. So in democratic industrial economies, journalism dedicated to covering innovation is vital.

Until now no recognized discipline of Innovation Journalism has existed, journalists covering innovation have had no community and 'Innovation Journalism' has been an unknown expression. Journalistic coverage of innovation has been attributed to various different disciplines—business or technology journalism, popular science or political writings. Innovation journalism overlaps with several traditional disciplines but the cultural rifts between those disciplines, e.g. business and technology journalism, prevented development of best practice in covering innovation. Business and technology journalists don't talk or work with each other enough for innovation journalism to occur spontaneously. A community is needed to bring people together and bridge the gaps.

¹ D. Nordfors. "The Concept of Innovation Journalism and a Programme for Developing it", *VINNOVA Information VI* 2003:5, Oct. 2003. Also published in *Innovation Journalism*, Vol. 1 No. 1, May 2004. <http://www.innovationjournalism.org/archive/INJO-1-1.pdf>

Our ongoing fellowship program² is testing the possibilities for Innovation Journalism as a practice and professional community with its own name, involving journalists from many different traditional disciplines who are exchanging ideas and comparing professional practices on how to cover innovation. In 2004, six Swedish Innovation Journalism fellows worked with U.S. hosts, developing personal skills and networks, while interacting via a discussion group. The First Conference on Innovation Journalism³ at Stanford University was arranged within the framework of the fellowship program, to bring together the emerging community. In autumn 2004 a second round of fellows was selected in the Swedish program. A Finnish Innovation Journalism Masters course started at the University of Tampere in November 2004. The Second Innovation Journalism Conference is scheduled at Stanford in April 2005.

This paper postulates why society needs Innovation Journalism and why such journalism might find commercial markets in innovation systems. Innovation is a primary driving force for economic growth in most OECD countries; its importance is increasing. Innovation systems must be improved and introducing Innovation Journalism can do this. And the innovation systems offer commercial markets for Innovation Journalism. The market opportunity depends on the type of innovation system.

2 Innovation Drives Economic Growth

Today, all developed industrial economies stand or fall with their industries' abilities to commercialize emerging technologies. Success in innovation brings growth and development; failure brings stagnation and economic decay. Leading industries and industrial economies that can't innovate will not survive. It can be argued that innovation is the single largest contributor to economic growth in many leading economies today.

Economic growth can come from increased input of labor or capital. If more people work more hours or if more capital is invested, the GDP of an economy grows. It can also come from increased productivity. If people work fewer hours, but more

² The blueprint of the "Innovation Journalism" fellowship program is presented in "The Concept of Innovation Journalism and a Programme for Developing it." D. Nordfors, VINNOVA Information VI 2003:5, (Oct. 2003). The model for conducting a fellowship program was developed and successfully tested in an earlier project, presented in "Introducing Internet-Enabled Expert Networks in a Country" by D. Nordfors, M. Bajuk, L. Norberg, J. Brinkmann and D. Forbush, Communications of the ACM, Nov 2003/Vol. 43, No 11, p. 127-132.

³ The First Conference on Innovation Journalism was arranged by the Innovation Journalism Fellowship Program, VINNOVA, the Swedish Government Agency for Innovation Systems, in cooperation with SCIL – Stanford Center for Innovations in Learning, Wallenberg Hall, Stanford University Apr 14-16 2004. Conference program: *Innovation Journalism* Vol.1 No.2 (May 2004). Conference Papers: *Innovation Journalism* Vol.1 No.3 (May 2004).
[Program:www.innovationjournalism.org/archive/INJO-1-2.pdf](http://www.innovationjournalism.org/archive/INJO-1-2.pdf)
<http://www.innovationjournalism.org/archive/INJO-1-3.pdf>

efficiently or for more valuable purposes, the economy grows even if no more capital is invested. This is innovation.

Data suggest that innovation is the most important driving force for economic growth in many countries. MFP/TFP⁴—Multifactor Productivity or Total Factor Productivity—is a metric that indicates innovation. MFP measures the joint influences on economic growth of technological change, efficiency improvements, returns to scale, resource reallocation, and other factors⁵. Innovation is reasonably a major part of MFP⁶, which has grown constantly during the second half of the 20th century. In the U.S., MFP has doubled⁷ since 1948. In the majority of OECD countries, from 1995-98, worker productivity grew more than worker populations, though each worker worked fewer hours. In many OECD countries MFP has become a more important driver of labor productivity than greater availability of capital per worker⁸. So increased productivity, not capital or labor input, is driving growth. If the MFP represents innovation, the majority of the OECD countries have upgraded their economies from investment-driven to innovation-driven.

This is good news. We need innovation, because if labor and capital were the only sources for growth, there would not be much light in the end of the economic tunnel for the European or U.S. economies, where populations are not only stagnant but aging.

Thomas Lindh at Sweden's Institute for Future Studies has investigated demography and growth. His findings: with no change in Swedish immigration or pension policies, if the quota between working and non-working people remains unchanged, Sweden will lack 3.5 million workers in 2040⁹, vs. today's population

⁴ MFP/TFP – Multi-factorial Productivity/Total Factor Productivity – explains the part of the economic growth that cannot be explained by changes in labor input and investments. If the same amount of work is put in, and no extra investments are added, the increase in productivity must be explained by changes that have made the produce more valuable or have increased the efficiency of producing and selling the produce. In growth theory, TFP is the scaling factor that is multiplied with the total input in the economic system in order to get the output of the system. Growth can be explained by an increase in inputs or an increase in the TFP scaling factor. Multi-Factor Productivity can be seen as a more humble name for Total Factor Productivity, implying that all the factors of productivity might be difficult to obtain

⁵ Multifactor Productivity Home Page. US Department of Labor <http://www.bls.gov/mfp/home.htm>

⁶ Multi-factor productivity measurement helps disentangle the direct growth contributions of labour, capital, intermediate inputs and technology. Caution is however advised in squarely equating MFP with Innovation. Not all technical change translates into MFP growth. Further, in empirical studies, measured MFP growth is not necessarily caused by technological change: other non-technology factors will also be picked up by the residual. (OECD Productivity Manual: A Guide to the Measurement of Industry-Level and Aggregate Productivity Growth. Jul 2001 (ISBN 9264194517))

⁷ US Bureau of Labor Statistics. MFP data 1948-2001.

⁸ OECD "A New Economy? The Changing Role of Innovation and Information Technology in Growth.", OECD Jul 2000. (ISBN 9264182128).

⁹ Thomas Lindh: "Åldrande befolkning får konsekvenser för budgetbalansen" ESV-Nytt Nr 1, 2003 , pp 12-13. (Published by Ekonomistyrningsverket <http://www.esv.se>)

of nine million! The problem is not unique to Sweden. Many other countries worldwide are in a similar situation. This problem cannot be solved without innovation. Many societies must prepare to maintain their economic wealth and vitality at a lower ratio of working population. This means investing in innovation to increase labor productivity.

At the EU Lisbon Summit in March 2000 the EU embarked on a strategy to make Europe the world's most competitive innovation- and knowledge-based economy by 2010—the 'Lisbon Process.' In parallel, the Council on Competitiveness, a forum including Michael Porter and presidents of major U.S. companies and universities, is assembling a 'National Innovation Initiative'¹⁰ for U.S. leadership in the global marketplace, technological innovation and education. So the importance of innovation for generating economic growth will grow and must be integrated into the public discussion.

Business journalism has taught people to discuss the relationships between interest rates, currencies and stock prices. Innovation journalism is needed to enhance the public debate through better common knowledge and understanding of productivity and innovation issues, including how innovation affects the national economy. We need to discuss how to become more productive.

Innovation does not happen spontaneously and needs more than one person to achieve. Innovation is performed by systems of different people and organizations. We must get acquainted with these systems and understand the innovation value chains.

2.1 Definitions: Innovation and Innovation Systems

Unfortunately, 'Innovation' is commonly seen as synonymous to 'Invention,' i.e. 'something new.' This may lead to misunderstandings. 'Innovation' should rather be seen as 'the *introduction* of something new.'

In 1934 Joseph Schumpeter¹¹ defined economic innovation as:

¹⁰ The National Innovation Initiative is run by the Council on Competitiveness, a nonprofit, nonpartisan association of leaders from the business, university, and labor communities. The initiative is chaired by Samuel J. Palmisano - Chairman and CEO, IBM Corporation and G. Wayne Clough - President, Georgia Institute of Technology. <http://www.compete.org>

¹¹ Schumpeter, J., "The Theory of Economic Development", Harvard University Press, Cambridge, Mass., 1934. Schumpeter's definition of Innovation in economy is (like in this paper) usually presented in a simplified form. Schumpeter's exact definition is the following: 1) The introduction of a new good—that is one with which consumers are not yet familiar—or of a new quality of a good. 2) The introduction of a new method of production, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. 3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before. 4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created. 5) The carrying out of the new organization of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position

1. Bringing a new product to market;
2. Introducing a new method of production;
3. Initiating a new market;
4. Opening new sources of supply of raw materials or half-manufactured goods;
5. Creating a new organization of industry.

The OECD Oslo Manual from 1995¹² is the recognized standard guideline on measuring innovation. It focuses on technology-driven innovation—by then technology was seen as the main source of innovation—sorted into products and processes. It says that innovations involve a series of scientific, technological, organizational, financial and commercial activities. It points out that nothing is an innovation until introduced to the marketplace. In 1997 the OECD followed up the Oslo Manual with ‘National Innovation Systems’¹³, an overview of the interactions underlying technological innovation on the national scale.

In 1987, Freeman¹⁴ was the first to explicitly use the concept ‘National Innovation System’ which he defined as

“ ... the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies.”.

Bengt-Åke Lundvall looked deeper into the theoretical aspects of National Innovation Systems in 1992¹⁵.

Studying National Innovation Systems is not enough. Michael Porter’s work on regional clusters has raised global attention to the value of regional innovative clusters as the driving force for national innovation systems¹⁶. According to

¹² OECD, “The Measurement of Scientific and Technological Activities. Proposed Guidelines for Collecting and Interpreting Technological Innovation Data. Oslo Manual”, 2nd edition, DSTI, OECD / European Commission Eurostat, Paris 31 Dec 1995. Innovation is defined in the following way: “Technological product and process (TPP) innovations comprise implemented technologically new products and processes and significant technological improvements in products and processes. A TPP innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation). TPP innovations involve a series of scientific, technological, organisational, financial and commercial activities. The TPP innovating firm is one that has implemented technologically new or significantly technologically improved products or processes during the period under review.”

¹³ OECD, “National Innovation Systems” 1997

¹⁴ “Technology and Economic Performance: Lessons from Japan”, C. Freeman, Pinter, London. (1987)

¹⁵ B. Lundvall (ed.): “National Systems of Innovation; Towards a Theory of Innovation and Interactive Learning” (London, Pinter, 1992).

¹⁶ “Innovative Clusters: Drivers of National Innovation Systems”, OECD, Jun 2001 (ISBN 9264187065)

Porter¹⁷, the national business environment in an innovation-driven economy (the most advanced and prosperous form of economy) is characterized by a large degree of interaction in clusters.

Sophisticated company strategies in innovation-driven economies require, among other things, a highly skilled workforce, improved infrastructure and more advanced research institutions. And, says Porter, sophisticated company strategies require increased access to better information.

Looking at Regional Innovation Systems, William Miller describes how innovative regions create a favorable environment or 'habitat' for innovation and entrepreneurship¹⁸. 'Habitat' is an interesting term here, suggesting that innovation and entrepreneurship come from the complexity and quasi-randomness of an ecological system, rather than from a well-oiled factory machine. In Miller's terms, a habitat is the combination of physical, legal and social mechanisms that promotes speed in product development and in cross-firm learning about both technical and business issues. This helps the region adapt to waves of innovation and adjust to economic cycles.

Apart from National Innovation Systems and Regional Innovation Systems, there are also Sectoral Innovation Systems, defined in 1997 by Malerba and Breschi¹⁹ as

“. . . the set of heterogeneous agents carrying out market and non-market interactions for the generation, adoption and use of (new and established) technologies and for the creation, production and use of (new and established) products that pertain to a sector (“sectoral products”).”

This contrasts with the traditional 'industrial sector' that maps industries with clearly defined boundaries, and categorizes firms with similar technologies and markets. A sectoral innovation system involves all kinds of people and companies, matching national and regional innovation systems. In short, an 'industrial sector' groups entities doing similar things, while a 'sectoral innovation system' integrates entities that do different things in the same innovation chain.

¹⁷ Michael Porter: "Building the Microeconomic Foundations of Prosperity" from the Global Competitiveness Report 2002-2003

¹⁸ Lee, Chong-Moon and William F. Miller, Marguerite Gong Hancock, Henry S. Rowan—Editors. 2000. "The Silicon Valley Edge—A Habitat for Innovation and Entrepreneurship." Stanford University Press

¹⁹ Breschi S. Malerba F. (1997), "Sectoral systems of innovation: technological regimes, Schumpeterian dynamics and spatial boundaries" in Edquist C. (ed), "Systems of innovation", F Pinter, London. Another useful paper available on the web is Franco Malerba: "SECTORAL SYSTEMS OF INNOVATION AND PRODUCTION", DRUID Conference on: National Innovation Systems, Industrial Dynamics and Innovation Policy. (1999). <http://www.druid.dk/conf-papers/conf-papers-attach/malerba.pdf>

Like any others, people working in innovation systems must know what is going on around them. This is why people follow the news. Innovation Journalism offers this news.

2.2 Competitiveness and Clusters

Economic ‘competitiveness’ and regional ‘clusters’ are strongly connected to the concept of regional innovation systems. Porter explains economic competitiveness like this²⁰:

“Competitiveness is determined by the productivity with which a nation or region uses its human, capital, and natural resources. Productivity sets a nation’s or region’s standard of living (wages, returns on capital, returns on natural resource endowments)”

“Nations compete in offering the most productive environment for business.”

“A sound macroeconomic, political, legal, and social context creates the potential for competitiveness, but is not sufficient. Competitiveness ultimately depends on improving the microeconomic capability of the economy and the sophistication of local companies and local competition”

Centralized, top-down processes and frameworks do not themselves create competitiveness. Dynamic influences emerge with activities interacting within the frameworks, often regionally—Silicon Valley, for example. Competition between top-down and bottom-up processes are part of competitiveness and frameworks should respond interactively with the challenges developed within them.

This matches the ‘Triple Helix’ concept²¹ often used to explain the dynamics of especially regional innovation systems: in innovation, university, industry and government are interdependent; and if the chemistry between them is right, they continuously push or follow each other in an upward spiral—a triple helix—that elevates the region.

Porter’s explanation of competitiveness focuses on regional clusters of co-locating businesses that benefit from each other’s differences and similarities, offering both partnership and competition. In such clusters, actors constantly rub shoulders, enabling co-ordination, sharing of resources, visible performance comparisons,

²⁰ Michael E. Porter “Microeconomic Foundations of Competitiveness - A New Agenda for International Aid Institutions”, Workshop with the UNDP Leadership Team New York, NY November 18, 2003.

²¹ Etzkowitz, H., Leydesdorff, L. (2000). “The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university-industry-government relations”. *Research Policy*, 29, 109-23.

rapid diffusion of best practices, enhanced ability to perceive innovation opportunities, and more.

To facilitate these competitive traits, various 'Institutions for Collaboration' emerge, from think-tanks to incubators. The core is usually an association for cluster protagonists that conducts or facilitates common actions—procurements, information gathering or international marketing. Theories for competitiveness and clusters have spread worldwide and are widely implemented. So far, cluster and competitiveness theory has said little about the role of journalism, though it is obviously influential.

Behind the concept of competitive clusters is the idea that when people are close together and communicate a lot, they will get to share each other's concerns, shape a common picture of the world they live in and their internal competition will increase the competitiveness of the cluster. So in well functioning clusters, cluster members will want to know what is happening inside the cluster. This enables a commercial role for journalism. And if journalism is driven by commercial motives, representing reader and advertiser interests, journalism will be an independent group of actors in the cluster.

In terms of the 'Triple Helix', journalism might be called 'the fourth helix,' similarly to politics, where it has been called the 'the fourth estate' for almost two centuries²².

3 The Role of Journalism in Innovation Systems

The Information Economy is an established concept. Economists have stressed the importance of access to better information in economical systems. Nobel prizes in economics have been given to people who have modeled the effects of sharing information, or models for what happens on a market when people don't share information, as in the case of Akerlof, Spence and Stiglitz who received the Nobel prize in 2001 for their theories on "asymmetric information"²³.

²² The term "Fourth Estate" refers to the press, both in its explicit capacity of advocacy and in its implicit ability to frame political issues. The Victorian essayist Thomas Carlyle might have introduced the expression. In *On Heroes and Hero Worship* (1841), he writes, "... does not... the parliamentary debate go on... in a far more comprehensive way, out of Parliament altogether? Edmund Burke said that there were three Estates in Parliament, but in the Reporters Gallery yonder, there sat a fourth Estate more important far than they all." (From Wikipedia - http://en.wikipedia.org/wiki/Fourth_Estate)

²³ The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel 2001 went to George A. Akerlof, A. Michael Spence, and Joseph E. Stiglitz "for their analyses of markets with asymmetric information" where actors on one side of the market have much better information than those on the other. Borrowers know more than lenders about their repayment prospects, managers and boards know more than shareholders about the firm's profitability, and prospective clients know more than insurance companies about their accident risk. During the 1970s, Akerlof, Spence and

A successful innovation system depends on interaction and shared knowledge between different professions, such as engineers, business executives, academics and politicians. The media are major sources of shared knowledge between these actors in the public, private and academic sectors.

Most people repeat and discuss the news, so the media direct communities' attention and actions powerfully. Many who read a news item feel that the new knowledge is confirmed when others discuss it or when they see it again in a different news medium. Such news has a greater chance of being accepted as fact. News media set a baseline for societal knowledge.

What's more, a news item tells consumers more than "*This has happened!*" It says: "*This has happened. Now you know that everyone else knows!*" Public announcement of shared knowledge has a clear market impact, for example on the forces that depend on asymmetric information.

About half of U.S. adults read a newspaper daily²⁴; in Sweden, four of five read a morning newspaper. The average Swede devotes about six hours a day to media consumption, including newspapers, magazines, books, radio, TV, CDs, video, and various Internet-distributed content.²⁵

Most macro- and micro-economists follow the news, as well as most skilled workers, researchers and company decision makers to whom Porter refers when outlining the innovation economy. Everyone knows that enormous resources in time, money and human efforts are spent on influencing media content. Obviously the media can set the discussion agenda like no other actor, and affect stock prices. Still the role of journalism in innovation has been examined little by academic research.

Journalism is a formidable influence in innovation systems. It can be rewarding to recognize this fact and study its mechanism. Economists can benefit by including news media in their models; journalists can get new insights in the structure of 'objectivity.' Journalists use 'objectivity' as synonymous with independence, fairness and other integrity issues important for good practice. True objectivity is utopian. Journalists need to know who depends on whom for what in the

Stiglitz laid the foundation for a general theory of markets with asymmetric information. Applications have been abundant, ranging from traditional agricultural markets to modern financial markets. The Laureates' contributions form the core of modern information economics. <http://www.nobel.se>

²⁴ USA: 47 percent read a newspaper on any given weekday and more than 60 percent read on a typical Sunday. Less than a third (28 percent) say they do not read the local daily newspaper in a typical week. Readership Institute (Northwestern University, Evanston, IL, US), National RBS Scores 2003. http://readership.org/consumers/rbs/data/rbs_2003.pdf

²⁵Nordicom-Sveriges Mediebarometer 2002, Nordicom, Gothenburgs University, Sweden, ISSN1101-4539; <http://www.nordicom.gu.se>

innovation systems, starting with their own positions, as they seek fair and independent reporting.

Recognizing and understanding the role of journalism in innovation systems will also reward public policy makers, since journalists' levels of understanding is essential for public debate and the quality of shared common knowledge. Many policy initiatives today increase teaching quality but few increase journalism quality. Considering that each teacher communicates his/her knowledge to hundreds or thousands, while each journalist communicates to hundreds of thousands or millions (who repeat this knowledge to each other), something is missing in public policy.

The OECD manual on National Innovation Systems stresses that information flow among people, enterprises and institutions is key to the innovative process, in tandem with technology flow. This implicitly states the societal need for Innovation Journalism.

There is an interesting German initiative "Innovation Communication", that looks into to how high-tech companies and research institutions communicate their innovation activities to the outside world and the press. The rationale behind the German initiative is that theories of innovation management show that the main characteristics of innovations (unknown, complex, abstract, ...) are quite opposite to the attributes that constitute – according to journalism theory – a newsworthy message (topical, simple, negative, ...), and that innovation actors need to learn how to communicate in a more newsworthy way²⁶. Such research will offer a necessary component to research about the role of journalism in innovation systems.

4 Innovation Systems as Markets for Innovation Journalism

Innovation Systems create value. People in those systems get rich by knowing who needs what, who said what about whom, what is 'cooking,' what to avoid. So the innovation systems should be good readerships for innovation journalism publications.

The analysis offered by the OECD manual on the composition of innovation systems can be used for identifying groups of news consumers that Innovation Journalism news producers may target, for suggesting types of interactions to cover in stories and for suggesting strategies to identify experts to interview that the news consumers will appreciate.

²⁶ The Innovation Communication initiative is headed by Ansgar Zerfaß at the cluster organization MFG Baden-Württemberg.

Innovation journalism can be a component in existing news media, aimed at increasing the value for existing consumers, for example for today's consumers of business news, technology news, popular science or general daily news. But innovation journalism can also be a main theme for fresh news sources that specifically target innovation systems, offering their actors valuable information about each other and other important issues that might affect their system. National, Regional and Sectoral Innovation Systems offer a variety of potential target audiences for Innovation Journalism.

4.1 National Innovation Journalism

National Innovation Journalism must focus on issues of national concern, targeting those involved in the national innovation system. Presumably, potential groups of news consumers are working with finance, law, national economy, academy, public policy and multi-national companies.

The attention of the market forces in innovation-driven economies must follow the ongoing shift in the economy from finance to innovation as the dominant driving force for economic growth. In investment-driven economies, investments drive innovation. In innovation-driven economies, innovation drives investment. The entities that lead the markets will shift attention from finance to innovation, or, in due time, pass market leadership to other entities that do. This process started decades ago and will continue to evolve.

Business and financial news media with high analytical capacity have these news consumers as their customers today. This gives them the market opportunity to be major players in National Innovation Journalism, since they can integrate business and technology journalism and want to broaden their readerships to R&D decision makers.

Another flavor of National Innovation Journalism may be offered by the popular science media, that usually explains to people how things work, rather than reporting who said what about whom. This approach can offer innovation professionals important background knowledge on how economy, technology, science and politics relate in innovation systems and processes. Innovation is complex, and today the supply is short of in-depth knowledge that can be shared by the various entities in innovation systems alike. Today, most people who are parts of innovation systems are not aware of what their systems look like, or how they work.

This said, many publications are built on traditions that are hard to change. It might well be that it is easier to start new publications for national innovation journalism than to reform old ones.

4.2 Regional Innovation Journalism

Regional Innovation Journalism serves regional innovation systems.

Since regional innovative clusters drive the national innovation system, as shown by Porter and others, there is a societal need and a market for Innovation

Journalism not only in national and international news media, but also in local news serving an innovative region.

Miller defines his habitat for innovation and entrepreneurship by the following qualities:

**Knowledge Intensity as the Only Path to Create New High Quality Jobs. * A Work Force with High Quality and Mobility. * A Business Climate that Rewards Risk Taking and Does Not Punish Failure. * An Open Business Environment. * Collaboration Between Business, Governments, and the Independent Sectors.* Ready Acceptance of Diversity and Youth in Institutions and Networks.* A Venture Capital Industry that Understands High Tech. Research Institutions and Universities that Interact Effectively With Industry. * Presence of modern communications infrastructure. High Quality of Life in the Community (schools, recreation, health, etc.)*

This clear-sighted definition of the habitat can be further improved by adding one more point:

* Trusted Local News Media that Understands Innovation and Presence of Other News Media that Reach Beyond the Habitat

For example, Silicon Valley has the San Jose Mercury News—a local newspaper with, vs. most other regions, superior coverage of the innovation system, and the San Francisco Chronicle—one of the largest regional newspapers in the U.S. with a large business and technology newsroom, serving the Valley's high-tech community. By reading the local newspaper daily, community members learn about who said what about whom and about what is happening in their regional innovation system. The news disseminates opportunities, strengthening collective trends.

Furthermore, Silicon Valley hosts local news offices of national news media, like the Wall Street Journal, or the headquarters of influential magazines such as Business 2.0, Red Herring or Wired, ready to raise national or global attention on interesting events. Silicon Valley would not be nearly as influential without the presence of the news media.

Regional innovation journalism is a potential major market for innovation journalism, due to the potentially large number of market opportunities and work opportunities for innovation journalists. Just in printed news media, in 2002 there were 777 morning newspapers in the U.S.²⁷. Obviously the number of local newspapers is magnitudes larger than the number of national newspapers. According to the Readership Institute Readership Behavior Scores for 2003, local newspapers penetrate a much higher percentage of target audiences than national

²⁷ Number of newspapers and circulations based on data from E & P; NAA Market and Business Analysis Department, published by Media InfoCenter.
http://www.mediainfocenter.org/newspaper/data/top_news_volume.asp

newspapers. Roughly half of the U.S. adult population reads a newspaper daily, and <30% don't read at least one newspaper in a week. What's more, local newspapers readers are better readers²⁸. Scores of local newspapers already reach the majority of people working in a regional innovation system. Some may become innovation news hubs for the regional innovation systems they serve.

At the same time it can in many bases be challenging to introduce regional innovation journalism as a component in local press with long traditions, that often lack experience of business or technology reporting, and are not confronted by competition that forces them to try out new directions.

4.3 Sectoral Innovation Journalism

Sectoral Innovation Journalism serves sectoral innovation systems.

Today technology news media are broadening their technology coverage with news about business, legal and policy issues relevant for engineers in technology. If these publications broaden their readership with the non-engineers they have started writing about, they will gradually evolve into Sectoral Innovation Journalism publications.

The Swedish publication *Elektroniktidningen* is in this process, based on covering electronic technology for electronic engineers. It has continually expanded its coverage to include related venture capital, legal issues and government R&D policies affecting electronic engineers. Through the new coverage, the magazine is also increasingly addressing investors, attorneys and policy makers interested in electronics. When *Elektroniktidningen* penetrates these groups, it will not only offer excellent innovation journalism, it will also become a Sectoral Innovation Journalistic publication.

Computer Sweden is the largest Swedish computer magazine, a position it earned by consciously targeting decision makers in the IT industry, introducing IT-related business news at an early stage.

Biotech Sweden is probably the first publication started with the goal of being a Sectoral Innovation Journalism Publication, though 'Innovation Journalism' was then unknown. According to founding editor Jan Sandred, they mapped and targeted the Swedish biotech sectoral innovation system as its readership from the start, offering technical, business, legal and political aspects of biotech innovations and the biotech innovation system²⁹. *Biotech Sweden* debuted in April 9th 2002.

²⁸ Readership Institute (Northwestern University, Evanston, IL, US), National RBS Scores 2003. http://readership.org/consumers/rbs/data/rbs_2003.pdf According to this survey, 68% of the US population reads a local newspaper. For 45% of the Americans, this is the only newspaper they read. Furthermore, the readership (the quality of reading) is several times higher among those who read the local newspaper than among those who only read a national newspaper.

²⁹J. Sandred: "Biotech Sweden – A Business Model Case Study in Innovation Journalism". The First Conference on Innovation Journalism – Conference Papers. *Innovation Journalism* Vol.1 No.3 May 2004 www.innovationjournalism.org/archive/INJO-1-3.pdf

The first issue set an IDG Sweden record for highest ad/editorial ratio—more than 40 %—of any of the company's launches³⁰. *Biotech Sweden* was also the fastest growing magazine 2003 in IDG Sweden. Revenue growth was achieved in a otherwise slow ad market. The November 2003 issue was the largest biotechnology magazine ever produced in Sweden, with 96 pages. In the first quarter of fiscal year of 2004 *Biotech Sweden* increased it's revenues by a record-breaking 125.6 %, ³¹ powerfully demonstrating the commercial potential of Sectoral Innovation Journalism.

By showing that Sectoral Innovation Journalism works commercially, *Biotech Sweden* also proved a point of interest for the knowledge of Innovation Systems as such. Each publication must write for a 'standard' reader who personifies the readership. Publications that don't personify their readership will not acquire readers and will fail. By succeeding, *Biotech Sweden* showed that the sectoral innovation system readership can be personified, i.e. that people working in sectoral innovation systems have common interests and want shared knowledge, indicating that the sectoral innovation system can have a common identity, the requirement for a self-conscious community.

5 Summary

Innovation is a leading driving force for the economies in the OECD. At the same time the population in the western world is aging, so innovation will become even more important for keeping up prosperity while labor intensity shrinks. People working with innovation need access to news in order to keep updated about who has said what about who, and what's on in their innovation systems. So innovation systems offer readerships for innovation publications. Since people do business with each other inside the innovation systems, also many advertisers should be found within these readerships.

While innovation systems can be markets for innovation journalism, they may also become more competitive from innovation journalism, by strengthening the sense of group identity and community within the innovation systems.

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³⁰ *Biotech Sweden* first issue record in highest ad/editorial ratio reported in IDG WorldUpdate Volume 32, no 14, 22 april, 2002

³¹ *Biotech Sweden* reported as fastest growing magazine in IDG Sweden by IDG WorldUpdate Volume 33, no 42, 8 december, 2003

Editor of Datateknik, then the largest Swedish magazine for IT professionals and founded and headed "IT och Lärande" (IT & Learning), that became the largest Swedish newsletter for educators. He was the director of research funding and director of communications of the Knowledge Foundation, KKstiftelsen, one of the largest Swedish research foundations, where he designed programs for knowledge dissemination and public understanding of science, as well as supported development and spreading of internet supported journalistic tools. He initiated and headed the first hearing about the Internet to be held by the Swedish Parliament. He has a Ph.D. in molecular quantum physics from the Uppsala University.

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