Poster Papers

Information Systems Governance and Industry 4.0 - Epistemology of Data and Semiotics Methodologies of IS in Digital Ecosystems

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Abstract. Contemporary Information Systems management incorporates the need to make explicit the links between semiotics, meaning-making and the digital age. This focus addresses, at its core, pure rationality, that is, the capacity of human interpretation and of human inscription upon reality. Creating the new real, that is the motto. Humans are intrinsically semiotic creatures. Consequently, semiotics is not a choice or an option but something that works like a second skin, establishing limits and permeable linkages between: (i) human thought and human's infinite world of imagination; and (ii) human action, with its correspondent infinite world of intentionality, of desire and of unexplored possibilities. Two instances are contrasted as two reading lenses of current business reality: IS governance and industry 4.0. These phenomena correspond to the need to take accountability, transparency and responsibility into account, when designing IS and when using such systems through the ecology of connectivity, Big Data and the Internet of Things. Political, social and cultural dimensions are brought into the equation, when addressing the question of the relevance and adequateness of IS theory and practice to respond to contemporary challenges. The message is that what has already been achieved is but a shadow, a pale vision, of what might be achieved in the age of the new Renaissance.

Keywords: Semiotic learning · Social semiotics · Material phenomenology
Poetic rationality · Data epistemology

1 Epistemology of Data and Semiotics

Challenging times call for challenging thought and action. The multitude of factors involved in addressing the relationship between technology and society is paramount. Semiotics enables addressing such complexity because semiotics analysis captures the

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value chain of signification and of meaning-making (Nobre 2007). Artificial Intelligence (AI) is a central knowledge area to take into account in order to situate, position and interpret contemporary societies. From understanding the power of AI it is possible to acknowledge the need for semiotic-based information systems' theories, such as Ronald Stamper's Organisational Semiotics (OS).

Bernard Stiegler and Bruno Bachimont (1996) are interesting authors whose contributions have helped to understand the importance of the epistemology of data. There are four paradigms that help to explain current contexts, in terms of historical evolution: first, the empirical age, where meaning emerged from practice; second, the theoretical age, where meaning emerged from ideas, such as Descartes' contribution to modern science; third, the period between 1950 and 1990, forty years of development of applied calculus; and forth, the present age of data manipulation.

Pédauque (2006) addresses the role of documentation in the context of post-modernity. The digital world and its capacity to cut the connection to the heterogeneous nature of reality, is both its strength and its weakness. Whilst digital media agglomerates everything creating an homogeneous set of data, semiotics maintains the heterodox nature of reality, therefore it does not loose meaning neither the meaning-making capacity.

Epistemological and phenomenological perspectives are needed in order to trace, to map and to explore the different dimensions of the complexity of IS contexts. Baranauskas and Bonacin (2018) address the role of design and of its relation to signs. IS governance will be part of business leaders' agendas once the full impact of their power to bring much needed change at global level is understood. Issues related to sustainability and to human development have much to gain from IS engagement in social innovation and in global change. The digital era has found in manufacture a stronghold for the creation of new possibilities of human realization. Lu (2017) calls attention to the open research importance of industry 4.0. The core idea is that new categories of thought and action, new cognitive structures, are the product of technological evolution. Such technical change, visible through realities such as industry 4.0 or augmented reality, is understood as an enabler of human capacity to read, to interpret and to intervene upon the world. This new digital world is both a product of human endeavors and a process through which humans create new realities, the new real.

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Value Co-creation and Local Content Development: Transformation, Digitalization and Innovation in the Oil and Gas Industry

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Abstract. This study explains how the co-creation of value in networks can lead to technological upgrades in a local industry (local content development) through transformation of business processes, digitalization of drilling rigs and innovation in oil extraction in the oil and gas industry of Kazakhstan. Theoretical perspectives on local content development (LCD) are predominantly informed by economic and political perspectives. The aim of this paper is to develop a strategic perspective on LCD in clusters. This is qualitative research which uses a case study approach.

Keywords: Oil and gas industry · Value Co-creation
Local content development · Digitalization · Clusters

1 Introduction

The broad definition of local content policy (LCP) assumes that it is - "an industrial tool that can enable domestic producers to expand their activities, at least partially with domestic inputs, and gain access to international technological and managerial expertise… [in order to] enhance their competitiveness" [3, 4]. While literature on this topic is currently emerging, this research agenda is predominantly informed by economic and political perspectives, strategic perspectives are virtually absent [3]. This is in itself problematic, because the reason why LCPs may fail is that they are based on an insufficient understanding of stakeholders' strategies and interests. This paper fills this gap in theory by embracing the role of LCPs in technological upgrade. Technological upgrade is defined as increased organizational performance and competitiveness as a result of improved technology capabilities.

2 Collaborative Approach to LCP

Shapiro and Rabinowitz [5] provided an explanation for cooperative approach to regulation in economics, suggesting that collaborative techniques have to be combined with punishment. A collaborative approach to LCPs that defines the expectations of the government, while providing the international oil companies with flexibility to develop

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its own local content plans and procurement procedures can achieve greater results. The reason why companies collaborate is joint creation of value, or value co-creation. In the management literature, value co-creation is a paradigm that has emerged from the service management field, innovation management studies, and marketing and consumer research [1]. It states that organizations interact with each other for the development of new business opportunities. Purposeful interaction creates benefits – driving dialogue, learning, and resource transfer. Firms act as resource integrators, as specialization forces them to access existing knowledge, skills, competences, people, products, and available investment [2]. This interaction which technological platforms often mediate, leads to innovation, participation, and improved services [1]. Therefore, ICT technologies has effect on performance of local companies in the oil and gas cluster, a network of interconnected international and local companies, including small and medium enterprises, specialized suppliers, service providers, firms in related industries, associated institutions (universities, standard agencies, and trade associations), government and citizens that co-create value and develop local content through interactions and exchange of resources, technology and management skills with each other. The role of LCP is to support value co-creation in clusters. This can lead to the technological upgrade, i.e. organizational performance and competitiveness based on improved technology capabilities and further local content development.

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The Interplay of FDI and R&D: A Study in the Seven Developed Countries

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Abstract. With the globalization process in the recent two decades, more and more countries are focusing on improving their technology to get more comparative advantages than other countries. The purpose of this paper is trying to explain the causality between foreign direct investment and R&D. We will analysis seven developed countries (Denmark, Finland, Ireland, Japan, the Netherland, the United Kingdom, and the United States) and use pooling data analysis to investigate this causality during the last 35 years.

Keywords: FDI · R&D · Developed countries

1 Introduction

The purpose of this poster paper is to investigate the causality of foreign direct investment and R&D in the developed countries. One of the motivations in the globalisation foreign direct investment, called knowledge, which means the company may separate their headquarters and R&D activities. For example, the headquarters may be in one market, but served the knowledge generated from another market. Therefore, the research question in this paper set as what is the role of research and development played in the foreign direct investment flow? More specifics of this research question could be if one country had high technology, whether that country would like to produce new products in their own country and to attract foreign country investment inward flow; or this country will 'sell' this new technology and conduct investment into other countries?

For example, the United States had the latest technology in the world, which makes it has a more comparative advantage than other countries. Thus, the United States could conduct investment into other countries in some specific area, like agriculture and labour-intensive industry. Therefore, there is a mutual partner relationship between the United States and the other countries. The same situation also could exist in the other nations. We use seven developed countries as an example to estimate if there is a significant relationship between foreign direct investment and local R&D activities.

2 Pooling Data Analysis

Table 1 indicates a brief regression result in individual countries, which is including three pair relationships between, FDI, local R&D activities, and economic growth. According to the Table, the first causality is about the FDI inward flows and R&D.

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Table 1. Regression result in seven countries

Country	FDIN to RD	RD to FDIN	FDIO to RD	RD to FDIO	GDP to RD	RD to GDP
Denmark	−	+	+*	−	+	+
Finland	+	+	+***	+***	−	−
Ireland	−*	−	−	+	+	+
Japan	−	−	−	+	−	−
Netherland	+	+***	+**	−	−	−***
The United Kingdom	+	−***	−	−*	−	−***
The United States	+	−	−**	−***	+*	−***

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In Ireland, FDI inward flows shows a significant negative influence on its R&D. That means in Ireland if they hold a high technology, the most thing they would like do is to conduct foreign investment in the developing country, which is their efficiency seeking motivation, rather than attract foreign investment from another developed country. On the other hand, the R&D in the Netherland displays a positive effect of FDI inward flows, but an antagonistic relationship in the United Kingdom.

For the second causality between FDI outward flows and R&D activities, in Finland, which illustrate a complementary relationship and also they have a positive influence on each other. That means the government prefer to spend more money on their innovation and to improve their unique technology, to have a comparative advantage; rather than conduct foreign investment into other countries. For the last causality, there is only one country, the United States, indicates the economic growth will support the R&D development. However, on the other side of this relationship, local R&D activities show a significant negative influence on GDP growth, which has the same result as the pooling data regression. Again, it has proved that in the short-run, the government could not get benefit from R&D Department.

3 Conclusion

In this paper, we have analyzed the relationship between foreign direct investment and technology in seven developed countries. In general, according to the pooling data regression (See Table 1), there is a bi-direction relationship between FDI flows and technology. However, the technology has a diminishing changed effect for both FDI inward flows and outward flows, which mean the technology, will not support FDI flows after few years. In another word, because the renewal of technology, the government have to update their technology frequently, to keep the high competition and comparative advantage in the global market.

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The Pattern of Foreign Direct Investment and International Trade: A Study of 30 OECD Countries from 1981 to 2015

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Abstract. This paper is a macroeconomic study investigating the causality of foreign direct investment and international trade. The research is based on 30 OECD countries from 1981 to 2015 and using data collected from official annual time series data. To interpret the causality in each country, we added six country profile factors to cooperate analysis whether different country profile factors would change the causality. The main findings indicate that there is a bi-direction always exists if the country has either pure high-ranking level of all the country profile factors or they have a pure of the low ranking level of country profile factors.

Keywords: FDI · International trade · OECD

1 Introduction

The primary purpose of this working paper is to measure the causality of foreign direct investment and international trade: whether they are 'complementary' to each other, or they could 'substitute' for each other. We will analysis 30 countries in OECD by using vector autoregression model; the endogenous variables of VAR model consist of FDI inward, FDI outward, export, import; and the exogenous variable in this model will be GDP at a constant price in 2005. To interpret the relationship between foreign direct investment and international trade, we will separate it into two parts: one is to analyze the effect of global trade on FDI, and the other one is to measure the impact of FDI on international trade. There will be four key relationships are including the effect of import on FDI inward, the impact of FDI inward on import, the effect of export on FDI outward, and the effect of FDI outward on export. The model will use in the paper showed below:

$$\begin{pmatrix} FDIN_t \\ FDIO_t \\ X_t \\ M_t \end{pmatrix} = C \begin{pmatrix} \phi_{11} \\ \phi_{21} \\ \phi_{31} \\ \phi_{41} \end{pmatrix} + \prod \begin{pmatrix} FDIN_{t-1} \\ FDIO_{t-1} \\ X_{t-1} \\ M_{t-1} \end{pmatrix} + ExogenousVariables + \begin{pmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{pmatrix} \quad (1)$$

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2 Contribution and Conclusion

The contribution of this paper is that we add five country profiles to analysis the regression result to explain the relationship between FDI and international trade. These profiles are including government institutions, market sophistication, knowledge input, knowledge and technology output, and product market regulations. We also use FDI regulatory restriction to divided 30 countries into two groups. There are 11 countries in the first group, which means they have a strict FDI restriction. The remaining 19 countries have a less FDI regulatory restriction is in the second group. Moreover, we use 'Y' indicate if one country has a strong comparative advantage in this sector; 'N' indicates if a country has a comparative weakness advantage than other OECD countries in this sector. Moreover, 'Y*' means this country has a relatively strong comparative advantage (the score above the average), and 'N*' means this country has a relative weakness comparative advantage (the score below the average). We found that the more factors the country has and also under the less FDI regulatory restriction, this country has a more robust relationship between FDI and international trade.

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