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Tracking based product authentication: Catching intruders in the supply chain

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THE EMERGENCE OF A NEW FORM OF IS OFFSHORE ENTERPRISE – THE MODERN HETERARCHY

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Abstract

This paper describes how IS offshoring organisations are changing in response to increased globalisation of the practice of software development. It posits the emergence of a new form of multi-national enterprise (MNE), described in this paper as a 'modern heterarchy', from the construct of the heterarchy originally developed by Gunnar Hedlund in 1986. The paper draws on theoretical antecedents in the discipline of international business studies, and is supported by empirical data gathered from two extended case studies of offshore IS projects. The research uses grounded theory techniques for the collection and analysis of data, and has particular value for IS practitioners in offshore IS MNEs.

Key words

Offshoring; globalisation; heterarchy; grounded theory; multi-national enterprise; international business

1   INTRODUCTION

This research is concerned with a particular form of globalisation: the practice of offshoring Information Systems (IS) development. IS offshoring uses low cost labour in distant countries to provide IS products and services for use in developed economies.

IS offshoring is nowadays deployed extensively and is regarded by many as a mature and cost-effective approach to application development and maintenance (Lewin and Peeters, 2006). Suppliers of offshore IS services have graduated from simple sourcing models - such as providing individuals to do specific tasks - to complex and sophisticated cross-border contractual and resourcing arrangements with their customers (Soota, 2002; Murthy, 2004). New project and organisational structures are required to take account of the dislocation of staff, which in turn demands new ways of managing development activities. Cultural traditions are often disrupted, both for offshore practitioners who come to reside in an onshore location and for the onshore individuals who encounter them (Tsotra and Fitzgerald, 2007).

The rapid development of the IS offshore industry has also resulted in the creation of large multinational enterprises (MNEs). Some of these have originated in industrialised economies – recent manifestations of systems integration (SI) firms such as Accenture which typically provide offshore software development as part of a wider portfolio of 'multi-shore' consulting, technology and outsourcing services. Others - so-called 'pure play' offshore IS providers such as Wipro - have originated in newly industrialising countries (particularly India) and for the most part export labour and IT-enabled services to developed economies.

Research on offshoring is at a relatively early stage, although it is experiencing more interest in recent years, as evidenced by the special issue of MIS Quarterly (King and Torkzadeh, 2008). By contrast, globalisation, MNEs and international business have long been the focus of research, although to date, few scholars have applied MNE theory to offshore IS MNEs, or to this sector as a particular example of international business. Since MNE theory has proven valuable in explaining how aspects of traditional MNEs function, it may further the understanding of potential changes in the structure and composition of companies that provide offshore IS services, and the forms of distributed multi-national IS organisations that may emerge in the future.

The purpose of this research is therefore to apply an international business perspective to the field of IS offshoring. It asks the question: 'are there antecedents in the field of international business that can inform the study of IS offshore practice?' and thereby seeks to add to the body of knowledge on the IS offshore phenomenon. The conclusions from this research will have particular relevance for IS offshore MNEs, whose structure, work practices and perspectives are affected by this phenomenon.

The research comprises a multiple case study approach using grounded theory techniques to analyse respondent interviews. The epistemological approach is firmly interpretive. The researcher shares the view taken by Galliers (1992) that IS comprises computer systems embedded in a social context, and not just hardware and software. Moreover, it is often the social context that gives rise to the most interesting and problematic aspects of IS (Hirschheim and Newman, 1991). This applies particularly to phenomena like IS offshoring, which are mainly concerned with commercial, social and organisational arrangements of IS.

This paper is structured as follows. In section one, the nature and scope of the research is described; section two presents a brief review of the literature on offshoring and international business, including a description of the main organisational constructs used to describe MNE structures. Section three describes the research method, case studies and analytic framework used. Section four presents findings from the research, and is complemented by section five, which presents the conclusions.

2 LITERATURE ON IS OFFSHORING AND MNES

2.1 Literature on IS Offshoring

The perspectives on IS offshoring in the literature present a wide range of opinion, from Farrell (2005) who asserts that offshoring offers huge benefits to both organisations and the economy, to Levy (2005) who presents a more cautious view of the benefits of offshoring. It is possible to summarise the existing body of research on IS offshoring as falling broadly into four categories, determined by the main perspective of the researcher.

First, there is the economic perspective, which highlights such factors as the commercial drivers for offshoring, labour arbitrage opportunities, contractual implications and so on. Examples of this viewpoint include Ang and Straub (1998), Lacity and Willcocks (1995), Farrell (2005), and Venkatesh and Krishna (2004) amongst others. A second point of view is cultural, addressing risks and tensions inherent in distributed software development across political and geographic boundaries. Examples of research that takes this as its primary viewpoint include Carmel and Agarwal (2002), Edwards and Sridhar (2003), David *et al* (2007) and D'Mello (2005). The organisational perspective focuses on aspects relating to the skills, expertise and organisational structures required when application development is distributed. Research by Doh (2005), Tolentino (2002), Evaristo *et al* (2005) and Oshri *et al* (2007) offer examples of this orientation. Finally, the operational viewpoint is dominated by consideration of such elements as the processes, methodologies, tools and infrastructure involved in IS offshoring. Harmsen *et al* (2007), Gopal *et al* (2002) and Nørbjerg *et al* (1997) all provide examples of research from this point of view.

Gopal *et al* (2003) and Murthy (2004) look at IS offshoring from the perspective of the IS offshore provider. However, there is relatively little research on IS offshoring as a form of international trade, and on the strategic management, organisation and operation of IS offshore MNEs.

2.2 Literature on organisation of MNEs

International business research on global organisations ranges from early studies of the theory of the MNE (Hymer, 1960; Dunning, 1973; Perlmutter, 1969; Buckley and Casson, 1976; Teece, 1977; Hedlund, 1986; Bartlett and Ghoshal, 1998) to more recent work by Peng (2004), Knight and Cavusgil, (2004) and Fan and Phan (2007). Early research on MNEs tended to view international organisations simply. Buckley and Casson (1976), for example, define the MNE as "an enterprise which owns and controls activities in different countries." Behrman (1974) identified three types of international organisation - the 'classic investor", the "international holding company" and the "multinational enterprise'. Porter (1986) examined firms in the context of their industries, which he categorised as 'multi-domestic' and 'global'. Perlmutter's (1969) ethnocentric and polycentric description of the MNE, essentially corresponding to centralised and decentralised operating models, offered a radically different perspective. Bartlett & Ghoshal (1998) define 'multinational', 'global', 'international' and 'transnational' businesses, characterised by the relative emphasis placed by the organisation on how it configures its assets and capabilities; by the role it assigns to its overseas operations; and by the way in which it exploits its knowledge and intellectual property.

Research from the 1990s onwards, such as Bartlett and Ghoshal's, has tended to place less emphasis on a hierarchical view of the MNE (headquarters controlling subsidiaries directly) and more frequently takes the view of the MNE as a network of differentiated intra- and inter-firm relationships (Tolentino, 2002). This perspective assumes a distributed labour division among subunits of the MNE arranged in an integrated network configuration (*ibid*).

3 RESEARCH METHOD, ANALYTICAL FRAMEWORK AND EMPIRICAL DATA

3.1 Research method and design

This research comprises a multiple case study approach (Yin, 2002) using grounded theory techniques to analyse respondent interviews (Glaser and Strauss, 1967). It is inductive rather than hypothetic-deductive, an approach that is suited to grounded theory analysis. Because this approach facilitates a process-based description of change in its organisational context (Orlikowski, 1993), it seems appropriate to the study of the offshore phenomenon, which is heavily process-based and organisationally dependent.

Regarding theory, the approach in this research combines the use of theory as an initial guide to design and data collection and theory as part of an iterative process of data collection. The limited number of cases means that the output is a conceptual framework and related propositions (Eisenhardt, 1989), and does not comprise a nomothetic theory.

In this research, a set of guidelines has been formalised into what is called an analytical framework, which in addition to providing guidelines for analysis also offers a structure for data collection, description and presentation of results, and for allowing the prioritisation and assessment of the relative importance and impact of the results. In this respect, the metaphor of research framework as scaffolding seems particularly appropriate (Walsham, 1995).

The macro-level 'actor', or unit of analysis, is the organisation or firm – that is, the organisations that provide IS services, both onshore and offshore. Four primary dimensions of impact of offshoring were selected, comprising cultural, economic, organisational and operational impacts. These categories emerged from the data, and were selected as being the most comprehensive; others categories could equally have been used. The cultural dimension of the analysis covers those impacts of offshoring that have primarily a cultural interpretation or significance. The economic dimension address impacts of offshoring that affect the actors commercially and politically. The organisational dimension is concerned with how offshoring is affecting the structure of IS organisations, and the skills of practitioners onshore and offshore. The operational dimension is concerned with factors that pertain to how offshoring impacts the processes, methodologies and tools of the actors considered.

3.2 Case studies and empirical material

Two offshore IS projects are used to provide a body of data for analysis. These were conducted over a period of 18 months from 2005 to 2007 in separate organisations in the financial services industry: one a UK retail bank, a subsidiary of an international institution, and the other a global insurance broker headquartered in the USA with its European headquarters in the UK. The two companies differ in size, structure and culture. The bank is headquartered in the south-east of the England and has a growing, motivated and stable IT workforce. The insurance broker is located in the City of London, and exhibits some of the organisational volatility and pace of change typical in this environment.

In each instance the primary offshore outsourcing provider was Capgemini, a global systems integrator headquartered in Paris – a typical IS offshore MNE. Other IS firms were involved in more peripheral roles. One project (Project MARS) involved the development of a package-based system to support a new lending product and the other (Project EUROPA) was a custom development of an existing system used to provide retail brokerage for customers across Europe. Both developments were initially of a similar scale – over 10,000 days of development effort – and both used IBM's Rational Unified Process (RUP) development methodology, although in different technology environments (Java for the bank; Assembler and COBOL for the insurance broker). On both projects offshore developers from Capgemini's Indian operation were located on site in the clients' offices in the UK and Belgium for at least part of the time. Thus the projects are philosophically similar (Orlikowski, 1993), drawing on the

same basic application development approach of use cases, separation of process and data, and iterative development phases.

The rationale for selecting two case studies is to allow the continuous comparison of evidence, and to control the conceptual level and scope of the emerging theory (Orlikowski, 1993). At a more basic level, observations made in one organisational context can be compared and contrasted with observations in the second site. The most striking difference between the two companies is in their organisational culture: the bank's culture is one that has a balanced approach towards risk, and displays a 'can-do' attitude to business, reflecting its origin as a successful, marketing-driven start-up. The insurance broker, by comparison, operates on a much more traditional, hierarchically-sensitive basis, typified by extended lead times for decision making and a risk-aware approach to business.

Primary data sources in the form of semi-structured interviews were gathered from client and Capgemini staff directly involved in the selected projects, both onshore and offshore. In all, seventeen interviews were conducted over a period of eight months (October 2006 to May 2007), in various locations in the UK, and by phone with respondents in India. These were supplemented by additional phone calls to validate points of fact. In addition, written data sources – project reports, memos, emails and letters - were collected and analysed. Data collection was aimed at gathering information (loosely) identified by the categories of impact defined in the analytical framework.

Walsham (1995) notes the importance of 'capturing' people's interpretations effectively in the course of a normal conversation. To facilitate this, all interviews were recorded and stored electronically as digital files in a 'wav' format. These were supplemented by written notes. The data was later analysed manually (line by line analysis of data), and using nVivo software.

4   FINDINGS FROM THE RESEARCH

4.1   The emergence of a new organisational form for IS offshore MNEs

The research indicates that new forms of IS MNE are evolving that are characterised by:

- A blurring in the distinction between onshore and offshore, with allocation of resources from multiple locations rather than solely from offshore locations;

- Greater distribution of risk between onshore and offshore parts of the organisation, and the introduction of commercial models to support this;

- Introduction of methodologies and toolsets that accommodate distributed development across multiple sites (a global development model);

- Rebalancing of skills across locations rather than simply downsizing onshore staff numbers.

This form of organisation is best described by the construct of the heterarchy (Hedlund, 1986) which at the time of writing was viewed as a departure from the more traditional (hierarchical) structures.

4.2   Cultural observations

For both the MARS and EUROPA projects, it is clear that offshoring no longer means pure labour arbitrage. Rather, it is a consequence of an increasingly integrated corporate view of operational efficiency, from the point of view of the supplier (Capgemini) and the customer. This aspect of offshoring is highlighted in the interaction between third party software vendors on project MARS, where there was an inverted relationship between project members in Mumbai and Cheltenham (where one of the project components was developed). Since development was coordinated by Capgemini, the third party in Cheltenham was effectively treated as 'offshore' by the Indian development team, some of whom were located in Reading in the UK, and some in Mumbai. Despite the disparity in cost of labour at each

location, this perception seems entirely justified. For example, from the perspective of scale and sophistication, Mumbai is a world city, and Cheltenham a backwater, so it is legitimate to view Cheltenham as 'offshore' through this philosophical lens. Further, 'offshore' resources in India are just as likely to have a broad world view as their colleagues in Cheltenham.

In effect, as these firms become less location-specific, the distinction between onshore and offshore becomes less relevant, and the commonly accepted definitions of the words, which relate primarily to the physical location of the IS resources, become redundant. This applies generally to the traditional taxonomy in the literature: words like 'subsidiary', 'host country', 'home country', 'headquarters', are less relevant in the heterarchical construct, which is peer-to-peer, collaborative and mobile. This represents a fundamental (primarily cultural) shift in the perception of offshoring.

Doh expresses this viewpoint as follows:

> "Moreover, as Levy (2005) notes, the development of communications technologies and the requisite mobility of labour have allowed for an accelerated internationalization of production that accords neither with the product life-cycle nor the sequential internationalization perspective. Indeed, some have argued that many firms are now 'born global' (Knight and Cavusgil, 2004) and that the notion of sequential internationalization – whether on a country, industry, or firm scale – is outmoded and anachronistic." (Doh, 2005)

Buckley concurs:

> "One issue is whether the firm should be divided into domestic and international divisions (in the era of globalisation now a rather redundant debate…)" (Buckley, 2002)

4.3   Economic observations

Global IS organisations are changing their business models fundamentally: in effect they are adopting a hybrid approach to offshoring that involves the use of joint onshore/offshore teams. There is a rebalancing of the development contact, with each part of the enterprise (onshore, nearshore and offshore) sharing risk and reward. This is different to the current environment, where typically the risk and reward is assumed disproportionately by either the onshore or offshore division.

This rebalancing of the development contract was illustrated in a discussion with the EUROPA delivery director, and concerned the extent of the risk assumed by the offshore division of Capgemini on the project. The traditional model is for Capgemini to use the Indian offshore business as a cost centre with a more sophisticated, risk-bearing onshore front end. The heterarchical model assumes that all development centres are equal, and capable of agreeing their own terms.

The EUROPA project delivery director proposed a different business model that involved sharing the risk – one that was readily accepted by the offshore organisation:

> "Yes, India is still run as a cost centre, so the UK or France or the front office country takes all the risk. ..We were trying to resolve this for smaller projects, to transfer risks, and at the time it seemed to me that this was a new way of working but one that they (*the Indian colleagues*) were absolutely up for. It was an explicit conversation: "Look, guys, we're not going to take the risk on this because this is a fixed price deal - you guys will have to bear it. Are you happy and comfortable with that?" And their view was, well great, finally somebody's taking some notice of us who are actually doing things we want to do."

This reflects a profound change in the way that offshore phenomenon is impacting IS organisations. It is independent of the pricing mechanism (the fact that the deal is fixed price is irrelevant here: what is important is how the risk is being shared between onshore and offshore components of the same organisation). This change represents a significant maturing of the offshore components and recognition on the part of the onshore part of the organisation that it can no longer dictate the terms of IS engagements with offshore colleagues.

4.4   Operational observations

The modern offshore MNE is adopting new tools and operational processes. However, these tools are basic for the most part, and often include software downloaded from the Internet. New processes - for example to conduct code reviews with developers - and new methodologies - for example to incorporate remote prototyping - are similarly being deployed. However, in the case studies in this research, these changes were basic, and were supported by web-based tools like Instant Messenger. The project manager on MARS describes the process of code review:

> "The only way we all kept in contact was Yahoo! And it's the only way to just maintain contact and you know, sometimes you'd just be cutting and pasting components of code and saying, 'How do you think this looks like?' or 'What do you think?' and it's great."

Similarly, few formal standards were in place, and those that existed were not strictly adhered to. Developers chose their own approach, with little apparent sensitivity around security, as described by a developer on the MARS project:

> "…we now have a standard toolset that we're supposed to use. All our J2EE components used Star Team (for change control) … and the guys in Mumbai just VPN'd in and used it … effectively, we got exemptions to do it our own way, which was maintain it on the client's site and we would VPN in and do it."

The rather informal use of methodology and tools on both the MARS and EUROPA projects hides the fact that all of the organisations involved in the development – users, onshore, nearshore and offshore – were closely networked and operated with a good deal of consistency and efficiency. The use of tools like Instant Messenger emphasises the immediacy of the interaction, and was complemented by the adaption of existing methodologies to cope with the new (distributed) environment: on the MARS and EUROPA projects, Capgemini had invested in building a distributed toolset and methodology to account for the fact that the operational impact of offshoring affects all aspects of the development life cycle. This illustrates a resourcefulness and agility within formal frameworks.

4.5   Organisational observations

From an organisational perspective, the skills and capabilities that offshore MNEs are retaining onshore include account management skill and technical skills. The MARS project delivery director describes these skills as:

> "…the bits which … require customer intimacy and intimacy with the business users. Those are the bits that, you know, people are almost presuming that they cannot be moved offshore."

On EUROPA, the account manager identifies the elements of her proposal that were most successful:

> "We provided them with a solution that gave them the ability to talk about those additional bits of functionality to a set of people who understood their business pain."

Her delivery director agrees, and notes that there are some technology skills that will also be needed onshore:

> "I think there'll always be early adopter technologies where people who are familiar with them will be of value locally. I think it's likely that strategic consultancy, IT strategic consultancy skills…project management skills and business analysis type skills..."

This research shows that a hybrid development approach – a characteristic of the heterarchical development model – is preferred. On project MARS, for example, the bank stipulated that offshore resources be brought onshore to the bank's premises for the duration of the project, as described by the MARS programme manager:

"They felt that it wasn't an option to do any of it offshore. It would have been a preference for Capgemini to do components offshore, but they (the bank) weren't prepared to consider that because they felt that the timescales were too quick… and the risks involved in doing that would be too great. And they felt they didn't have the maturity as an organisation to do that. So they were absolutely clear they didn't want anything built offshore."

5 CONCLUSIONS

5.1 The emergence of the modern heterarchy

While the evidence that emerged from the case data is mostly consistent with previous studies, the use of an international business lens to interpret these sheds new light on these findings and creates new insights from this research. From observing the offshore MNE on the projects, it is clear that a new organisational form is emerging that exhibits the essential qualities of the heterarchy described by Hedlund (1986).

The construct of the heterarchical organisation describes a networked organisational model. A key strategic difference with traditional organisational paradigms is that the heterarchical company seeks to exploit competitive advantage from any part of the global organisation, and not just from the 'home' market. The structural differences are more complex, and posit that the heterarchical company has many centres; that subsidiaries and their management are equally capable of contributing strategic thinking and value; that organisation is collaborative in nature rather than coercive, and generally that each part of the organisation is a reflection of the whole. This latter point implies that every member of a heterarchical organisation is aware of all aspects of the firm's operation (*ibid*).

Hedlund presented his model as 'radical' and saw it more as a 'loosely-defined' or theoretical construct than an actual manifestation of reality. He predicted that such organisations might emerge in the future, possibly in newly developing countries. Writing in 1986, Hedlund used words like 'novelty' and 'radical', and his goal was to generate debate. He coined the term 'hypermodern MNC' to suggest that existing 'modern' theories and notions used in international business thinking were inadequate, and used 'heterarchy' as an antithesis to hierarchy. (Hedlund's multi-national corporation (MNC) is synonymous with the multi-national enterprise (MNE)).

Predicting where such companies emerge, Hedlund identifies industries characterised by:

"…the use of many different technologies, high but not maximum global homogeneity of demand, fast rate of technical and market change, non-trivial scale economies (but not necessarily in manufacturing), and absence of strong local barriers to entry". (Hedlund, 1986)

and notes that IT and biotechnology are obvious (if boring!) candidates. More importantly, he suggests that:

"In terms of geographical and corporate origins, heterarchical MNCs are more likely to evolve from less than gigantic firms, and from contexts with a history of rather autonomous and entrepreneurial subsidiaries. This may give European firms an advantage over US ones. In a larger picture, MNCs from newly modernising nations may stand an even better chance." (*ibid*)

The reason the term 'modern' is used as a qualifier is because Hedlund's construct does not describe IS offshoring MNE perfectly. He was writing in 1986 and even in the space of 23 years, much has changed. The pace of globalisation has accelerated, and its nature and profile greatly debated. IS offshoring in 1986 was at an early stage of development, and bears little resemblance to the nature of the phenomenon today. Although instinctively grasping the statelessness of the heterarchical MNE, Hedlund nonetheless defines the strategy of the firm in terms of 'home' markets, an irrelevant concept for the modern heterarchy:

> "The heterarchical MNC differs from the standard geocentric one both in terms of strategy and in terms of structure. Strategically, the main dividing line is between exploiting competitive advantages derived from a home country base on the one hand, and actively seeking advantages originating in the global spread of the firm on the other." (Hedlund, 1986)

Further, his notion of heterarchy implies differentiation, similar to the 'differentiated network' described by Rugman and Verbeke (2003). The modern heterarchical firm is decidedly undifferentiated, deploying its resources in a manner dictated not exclusively by location (for example, from a 'centre of excellence') but by a mix of factors including cost, availability, location, proximity to the client and strategic intent (for example, by the desire to expand a presence in a particular country). A good example of this was provided by Capgemini's use of Accelerated Development Centres on project EUROPA: resources from France, Holland, India and the UK were deployed to optimise cost and expertise.

Similarly, the rebalancing of project risk on project MARS is giving rise to a new commercial model to accommodate heterarchical operation. It acknowledges that the traditional 'brokerage' business models of the western IS providers are changing to a more equitable distributed business model. The flexible approach towards development toolsets and methodologies on both EUROPA and MARS projects typifies modern development techniques. It is moreover entirely consistent with the heterarchical construct to the extent that the development infrastructure (telecommunications, tools, methodologies) can be defined as heterarchical. The Internet is stateless, networked and (mostly) immediate, and the collaborative toolsets that comprise Web 2.0 technologies are collaborative, peer-to-peer and instant. From an organisational perspective, the deployment of varied skills across distributed locations is consistent with the concept of a heterarchical enterprise, which recognises that low-cost offshore development on its own does not necessarily meet client demands; nor does aggressive labour arbitrage on its own represent a wise competitive stance (Hedlund, 1986).

All of these outcomes provide further evidence of the emergence of a heterarchical enterprise, and a move towards a more strategic deployment of offshoring analogous to that illustrated in Carmel and Agarwal's stage model of offshoring (Carmel and Agarwal, 2002).

5.2   Evolution and maturity of the modern heterarchy

The research indicates that IS organisations will not necessarily find the evolution to becoming a modern heterarchy easy, particularly those organisations that are at an early stage of development and only now coming to understand the implications of a truly global market for IS service provision. This is a difficult transition for most onshore organisations, and there is little information available to guide them:

> "The newly integrating nature of this global labor market has strategic and tactical implications for companies and countries alike. Information and insight about it are sparse, however, and executives and policy makers have little of either for making the decisions they face." (Farrell *et al*, 2005)

Moreover, there is no definitive model: the modern IS heterarchy is not entirely uniform. The world is not flat, as Friedman (2005) has described it: it is bumpy and uneven, containing all sorts of inequalities, inconsistencies and irregularities, and one size does not fit all. For the MARS and EUROPA projects, for example, the recruitment and resourcing process was novel and problematic, as described by the Capgemini UK account manager:

> "…it was difficult because it was a new process. So it was difficult identifying the right skills and getting the handshake between the UK and Mumbai working effectively. … so we had somebody managing this, more or less full time, for about two weeks, two or three weeks, setting up the process, setting up the documentation around it, so there was clarity around who'd been interviewed…"

This led to delays in the project start date for both projects, something that was complicated by the fact that the public processes to facilitate offshoring were not optimised, and required significant client as well

as multi-shore organisation involvement. For example, the UK's Home Office was not geared up to accommodate large scale offshoring in the UK, and the Capgemini project manager for MARS had to spend a good deal of time resolving these issues:

> "'Yeah, there were (difficulties bringing developers to the UK from India) and we had to write letters to the Home Office explaining what the contract was. We had to give them copies of the contract. … Initially, we got the visas for too short a period, and so we had to have people who went offshore. We sent them back to Mumbai, so that they could get visa extensions. So that was quite complicated and costly and disruptive."

5.3 Theoretical and practical contributions of this research

This research uses powerful explanatory constructs from the related but substantially different discipline of international business and successfully applies it in the field of IS. Specifically, Hedlund's construct of the heterarchy is adopted - together with related organisational taxonomies from Perlmutter, Porter and Bartlett and Ghoshal - to provide insight on offshoring.

This has the effect not only of validating the imported constructs, but also of illuminating the topic being researched. In this instance, the contribution validates the construct of the heterarchy and shows its continued ability to explain complex aspects of IS offshoring such as how IS offshore MNEs are organising. Such cross-disciplinary borrowing is endorsed by one of the leading researchers in this area:

> "In its successful era, international business researchers not only imported concepts and paradigms, they also exported them to neighbouring areas. This does not seem to be occurring at the moment." (Buckley, 2002)

While the explanatory power of the heterarchy is significant, it does not completely describe the new offshore IS organisations. This research accordingly extends the construct to take account of the elements of offshore MNEs that are new and different to previously researched MNEs. The extended construct – the modern heterarchy - offers a richer view of these new IS organisations, and therefore provides a significant contribution to the wider field of IS studies. It is potentially of interest also in the field of international business studies where the constructs originated.

This study has direct relevance for IS organisations engaged in IS offshoring. If it is accepted that the modern heterarchy is the form of organisation to which many IS MNEs will evolve, then there is much in this and in antecedent research that can help inform this evolutionary continuum. For 'end user' organisations, there is enough detail regarding the phenomenon to provide guidance in the deployment of offshoring with both offshore and onshore systems integrators.

5.4 Future research directions

While this research did not evaluate pure play MNEs to the same level of detail, secondary evidence from respondents suggests that they also are becoming modern heterarchies. This is because the pure play strategy is now focused on building solid customer relationships in local markets, while retaining the efficiencies and disciplines that come from centralised control. The onshore IS firms are also changing strategy: to compete against the structured, centrally-driven offshore organisations, these firms are developing development 'factories' in offshore and onshore locations that are modelled on the offshore organisations' 'global' strategy. In effect, onshore and offshore IS companies are now indistinguishable in strategic intent, and each has co-opted elements of the other's strategy.

Further planned research will look to validate this conclusion. It will also extend this reasoning to other dimensions identified in the analytic framework to assess, for example, the impact of global IS offshoring on IS practitioners 'onshore' and 'offshore'.

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