International sourcing and asymmetry: how Western software entrepreneurs tap and decant Ukrainian engineering skills

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ABSTRACT
The international IT industry has been hailed as the epitome of the new global economy, appearing footloose in its productive and marketing activities across national borders, and drawing on the talents of an apparently homogenous and internationally dispersed cadre of knowledge workers. In this paper we refer to recent international re-engineering of the software development process to suggest that it encompasses a division of labour amenable to spatial separation. By contextualising the delivery of architectural and creative functions in the Western part of Europe, and more routine activities in the post-socialist territory of Ukraine, we are able to explore the embedded nature of dispersed inputs into product and service manufacturing in the sector, and the complex managerial issues associated with co-ordinating sourcing over highly diverse and asymmetrical institutional and cultural zones. We identify contrasting strategies employed by IT companies to mitigate the risks associated with operating over distance and to capitalise on the reserves of engineering knowledge and skills possessed by ‘nearshore’ service providers.

Introduction: the outsourcing of software development and the international division of labour

At the outset, it is instructive to define key terms. In this article, ‘outsourcing’ refers to the contracting of a job to another company, with the country in which the work is performed being irrelevant, ‘offshoring’, by contrast, refers to moving jobs out of the country, whether or not they leave the company (Blinder, 2006). The term ‘offshore outsourcing’ therefore denotes the transference of an activity or function both outside a company and outside a country. ‘Nearshoring’ refers to the offshoring of work to a proximate geographic location.

The significance of distance, both geographical and cultural, has been somewhat neglected in many studies of offshore outsourcing of business services. Rather it is has been widely assumed that advances in information and communications technologies (ICT) have rendered geography irrelevant as a ‘jigsaw’ of business function and components can be disaggregated, digitalised, relocated and reassembled in a highly...
cost effective manner (Kenney, Massini & Murtha, 2009; Metters & Verma, 2008). The software development industry, which provides the empirical focus of this paper, apparently epitomises such fluidity in the global organisation of work, and has indeed been heralded as a major agent of ‘world levelling’ (Friedman, 2006). Friedman argues that, since the early part of the millennium, this emblematic sector of the new global economy has been able to straddle international borders readily and in a footloose fashion and that this has been facilitated by massive investment in broadband connectivity through undersea cables, proprietary software that enables remote development and the existence of an internationally ubiquitous cadre of ‘knowledge workers’ who are prepared to service the industry. According to Friedman, new information technology may be regarded as the driving force of ‘world-flattening’, facilitating the connection of ‘all the knowledge centres of the planet into a single global network’ (Friedman, 2006:8).

However more sanguine, and empirically informed, accounts of the process of global sourcing of services are now recognising the vital significance of geography in the anatomy of offshore outsourcing decisions. Ørberg Jensen and Pedersen (2011), for example, suggest that the choice of offshoring location is based on the fit between the attributes of different destinations and the nature of the offshored business activities. These authors identify a logic whereby manufacturing is relocated to low-cost destinations and research and development to higher-cost locations. Indeed, it seems that compelling rationalities impinge on the geography of offshoring, relating, primarily, to labour cost advantages, but also, significantly, to levels of education and expertise as well as language capabilities (Manning et al., 2009).

Turning more specifically to the dynamics of the offshoring process through global commodity chains (GCCs), Levy (2005:692) contends that such strategies are interconnected with more conventional forms of political power since ‘market structures are embedded in social relations that position the state as promoter of corporate rather than national interests’. A compelling strategic rationality for the construction of GCCs is to enable the transnational enterprise to pursue indomitable market power through the construction of internationally configured and unique assets and capabilities. In such circumstances, companies themselves are likely to benefit in a financial and competitive sense, yet firm-level performance becomes increasingly detached from the welfare of countries or indigenous workers delivering such ‘added value’, regardless of how hard they work or what specific skills they possess (Levy, 2005:690). Indeed, as Humphrey (2000) contends, offshore outsourcing may be associated with a deterioriation in the status of offshore providers, particularly in developing countries, because it entails the simplification of linkages with partners and the codification of previously tacit information. Turning, to the effects of GCCs on developing countries, Levy (2005) asserts that, while elitist networks associated with first-line suppliers may be economic beneficiaries, it is also apparent that a large swathe of the working population is bypassed or displaced through the inception of GCCs (Kaplinsky, 2000).

The software development industry, in particular, offers a contradictory picture of the international division of labour. On the one hand, the sector exemplifies path-
dependent tendencies towards concentration of people and processes in specific geographic locations in advanced Western countries such as Silicon Valley in California and the South East of England. The ‘crown jewel’ of a software product company is its code, which is invariably subject to proprietary control by headquarters (Carmel & Tija, 2005). Geographical concentration of innovation continues to be perpetuated by two key factors; firstly, through access to talented designers, software engineers and programmers; and secondly, through proximity to large and technically sophisticated users. The USA dominates on both of these counts (Aspray, Moyadas & Varda, 2006).

Separation of inventive and production functions is by no means restricted to software development. Mariani (2001), using data relating to Japanese investments in Europe, found that in low and medium R&D intensive industries laboratories are more likely to be located close to the point of production than in more R&D-intensive industries. In respect of the latter organisations, this author states:

*Their major characteristic is that generic knowledge, once produced, is not tied to the organisation and the context in which it is generated, and is quite independent of demand-specific adaptations. This implies that, once an innovation is introduced, it can be used in several applications without having to re-invent the original idea every time. In this sense generality commands the centralisation of research, and allows for the portability of its results across contexts and distances.* (Mariani, 2001:135)

On the other hand, offsetting concentration of the higher order creative and architectural R&D based functions, there has been a strategic realisation in recent years that economies can be gained, in a highly competitive market environment, by separating out more programming based activity and relocating its performance to lower-cost locations overseas. The introduction of microcomputers and networked computer terminals has added impetus to the decentralisation of more routine functions.

It is tempting to assume that information technology itself possesses a geographically transcendental quality, digitalisation and ‘cyberspace’ serving to intersect and flatten global cultural and institutional ‘irregularities’. As Woolgar asserts, globalisation has comprised the rapid movement and spread of both symbolic and financial capital, and:

*electronic technologies facilitate the rapid traffic in communication, the instantiation of activities and institutions at widespread locales, and the insinuation of standardised identities and imagery (especially brands) in multiple locations.* (Woolgar, 2002:19)

Yet, sociological work on technological development has recognised that technology itself is a socially and economically embedded phenomenon. (MacKenzie & Wajcman, 1985). Accordingly, the transposition of ‘virtual’ organisational forms to offshore locations necessitates their grounding in existing work practices within the normality of existing relations (Hughes, Rouncefield & Tolmie, 2003). Indeed, as Woolgar also notes:

*The very effort to escape local context to promote one’s transcendent global (and/or virtual) identity, actually depends upon specifically local ways of managing the technology.* (Woolgar, 2002:19)
Carmel and Tija reinforce such observations, arguing that, Offshoring ... adds threats and vulnerabilities that do not exist in domestic outsourcing and increases vulnerabilities that exist in all inter-network commerce ... Distance adds complexity and vulnerability because cyber-space is actually a complex of real-world service providers in distinct jurisdictions with varying cultures, all under cost pressures. (Carmel & Tija, 2005:32).

In this paper we ask whether distance matters in the international sourcing of business services and operations, a question which has arguably been neglected in the literature to date, by concentrating on the nearshoring of software development from Western European providers to Ukrainian recipients. By examining such geographically close, but institutionally distant, regions which provide the embedded and extended home localities for embryonic international chains of production in the software development industry, we are able to probe the risks and realities of managing over institutional and cultural distance and to investigate the courses of strategic action embarked upon by software capitalists and executives designed to alleviate such risks.

**International sourcing strategies**

There has been some recognition that the decision to offshore is inevitably associated with risk, and that the degree of risk may increase over distance. Verbeke (2009), exploring the contribution of Ghemawat (2001) asserts that:

*Even in the contemporary era of advanced communications technology and enormous international trade, senior managers still need to take into account distance when assessing host country location advantages and making decisions about global expansion.* (Ghemawat, 2001 quoted in Verbeke, 2009:129)

Manning et al. (2009) suggest that a number of risks are associated with offshore locations, including risks to political stability, wage inflation and intellectual property (see, for example, Doh, 2005; Lewin & Couto, 2007). In attempting to alleviate such risks, it is evident that a number of companies, particularly in Western Europe, have tended to prefer ‘nearshore’ to ‘farshore’ locations, when relocating business functions across spatial territories, at least in the first instance. This contrasts with the regional sourcing preferences of North American companies, which have generally opted for ‘farshore’ locations, notably India, China and the Philippines (Manning et al., 2009). Such contrasts in the geographical orientation of sourcing companies, depending upon country of origin, may reflect specific and contrasting socio-economic characteristics of North American and European regions. The ‘new’ Europe, now embracing former socialist societies into its political and trading structures, offers considerable labour cost differentiation, combined with highly-developed reservoirs of engineering talent, across geographically proximate zones easily accessible by air. Moreover, the new Europe embraces numerous ‘varieties of capitalism’ (Hall & Soskice, 2001), ranging from ‘liberal market’ to ‘co-ordinated’ and ‘transitional’ economies. Such political and institutional ‘bumpiness’, evident over relatively modest geographical space, is less apparent in the USA.

As Manning et al (2009) observe, drawing on Rugman and Verbeke (2004), international business expansion in regions close to headquarters is associated with
a number of strategic advantages. Geographical proximity can reduce transportation and travel time, this being important if staff training in subsidiary units needs to be executed in a personalised fashion, particularly in the first stages of set-up. Physical closeness may also pay dividends in the early ‘search’ phases of establishing overseas subsidiary units, which may rely on informal contacts and tacit knowledge. Similarly, internal co-ordination between cross-national organisational units (as opposed to the need for 24/7 liaison with external customers or clients) can be enhanced through time zone proximity (O’Leary & Cummings, 2007). It has also been argued (e.g. Rugman & Verbeke, 2004) that cultural and institutional similarity across home and host international organisational units is consistent with the achievement of normative integration and ‘psychic proximity’ (Johanson & Vahlne, 1977) between home and host country actors, implicit human understanding and trust representing a vital facilitator in international business re-engineering.

The ‘geography of risk’ has already been well understood in corporations at the vanguard of offshore outsourcing of business services. For example, a leading US-based financial services corporation which now enjoys an expansive global footprint in regions including India, China and the Philippines, commenced its international sourcing activity in a modest fashion, first ‘testing the water’ and accumulating necessary managerial expertise, through nearshoring experimentation (Marshall Park & Hollinshead, 2011).

The reality of work in software development

The software development industry may be depicted as the knowledge sector flagship of the information age, and its modernist appeal exerts a powerful normative effect on those working within the sector as well as consumers of its products. The industry is inherently youthful in its orientation and perhaps remains symbolically defined through the characterisation of the Silicon Valley computer ‘geek’. As Morgan and Sayer (1988:37) assert, ‘the wonderment at the technology seems to have the effect of suspending people’s critical faculties!’ Software developers are often regarded as typical ‘knowledge workers’ (Reich, 1991; Scarbrough, 1999), but, as Barrett (2004) remarks, surprisingly little is known about the labour process or management control strategies in software development work.

In a study of methods of organisational control employed is the Indian software services outsourcing industry, Upadhya (2009) finds a prevalence of top down Taylorist systems of ‘panoptical’ control being exerted by company managements on knowledge workers in a context of unequivocal obligations to satisfy customers and fulfil contracts on time. Extreme conditions of labour intensification, and the exertion of pressure to perform from both managers and peers is at odds with the officially-presented view of corporate culture in the software industry, which, in keeping with the trappings of ‘soft capitalism’, manifests itself in prestige working environments, ‘employee friendly’ HR policies and high rates of pay (Upadhya, 2009). These facets of employment are associated with a ‘cultural labour process’ which emphasises communication, collaboration, teamwork and knowledge sharing through the building of strong social networks (Hakken, 2000). According to Upadhya, such instruments of control...
have (supposedly) replaced authoritative forms of bureaucratic regulation of work in knowledge-intensive industries, where control over employees’ knowledge is an over-riding objective. In understanding the response of the Indian knowledge worker subjects to ‘new age’ management techniques, Upadhya’s observations are insightful. She states that:

*On the one hand, many seem to have absorbed the dominant discourses of the global corporate workplace and accepted the industry’s self representations, retailing the official position in their narratives. In this sense, contemporary ideologies of self management, individualism and ultimately of the market do gradually invade their lifeworlds. But while employees appear to engage in ‘self subordination’, they often articulate critical counter–narratives and mount resistance through negotiation. Their ‘subjectification’ is not total – the frustration of HR managers dealing with a flighty and unpredictable workforce can only be explained if we recognise the multiple strategies through which employees in turn ‘colonise’ software organisations, seizing the opportunities provided by the new industry to further their own agendas.* (Upadhya 2009:15)

Barrett (2004) similarly depicts a predominantly instrumental orientation to work on the part of software engineers, whose skills are frequently in demand. This author suggests that, if software developers become seriously disenchanted with their work, their most likely course of action, reflecting pragmatic individualism, is to quit. She also reveals that, despite the ‘glamorously nerdy social identity promoted by the popular (business) press’ (Barrett, 2004:779), workers in the Australian software development industry are not immune from the forces of managerial control which characterise the labour process more generally, and which may promote responses of compliance or resistance from those in employment. This author distinguishes a two-tier work process in software development. **Primary** software products, including word processing packages or operating systems, are developed by individuals or software firms and are sold as packaged software often for further development (Carmel & Sawyer, 1998). Such products are invariably new and ‘leading edge’, requiring high levels of creativity and discretion, their development being likened to an ‘art’ (Barrett, 2004). On the other hand, **secondary** software products usually constitute custom-built, organisationally specific systems, such as utility billing, human resource information and airline reservation systems (Brady, 2004; Carmel & Sawyer, 1998). Such products are typically developed according to system specifications that determine the shape and scope of the final product. Here, production follows a ‘waterfall’ process (Brady, 1992) with design, programming and testing parameters being clearly pre-specified according to the client’s requirements (Barrett, 2004).

This distinction is useful because it suggests a stratification in occupational status in an industry which is nevertheless unified by the ethos of the ‘knowledge worker’. However, while the first category reflects quite accurately the creative, liberated and upwardly mobile reputation of software development work, the second delineates a determination of the work process through prescribed formulations emanating from client or customer requirements. Thus, secondary programming activity, which undoubtedly forms the majority of offshored capability, is, by its nature, subject to
control and scrutiny of performance. Potentially, such control may be exerted directly by clients or customers, or customer demands may be mediated through the agency of management, which will, nevertheless, be rigorous in its assertion of quality standards and deadlines for project completion.

However, even in respect of secondary developmental activity, it is likely that enlightened software management teams will foster autonomous working, albeit in a constrained or bounded fashion, either for individual engineers or, more commonly, for teams. Such autonomy is likely to be restricted to making suggestions for improvements in the technical nature of the product, rather than the establishment of strategic or research agendas (Barrett, 2004). The logic of such ‘empowerment’, however, derives from the hyper-competitive nature of the software industry, in which ‘agility’ in developmental turnaround is critical. In such circumstances, management is concerned to embed dynamic and direct communication between ‘scrums’ of engineers and corporate customers, and to imbue a sense of client loyalty amongst the former.

Therefore, it may be argued that the management of the labour process in the software industry is dialectical in nature, simultaneously fostering autonomy and creativity in the work orientation of engineers while rigorously controlling and monitoring the meeting of project deadlines and quality standards (Barrett, 2004). Similarly, Sewell and Wilkinson (1992) assert that a paradox characterises recent developments in the software labour process whereby managerial strategies give rise to decentralisation and devolution for tactical decision-making while at the same time generating higher levels of control and surveillance. Countering more benign views of the use of technology as a resource in high-involvement work practices, these authors suggest that employees are locked into a form of ‘electronic panopticon’.

Ukraine as a nearshore destination
The geographical locus of our study is Ukraine, a country which has emerged only recently as a player in international software development, yet which is well endowed with technical and engineering skills as a legacy of the Soviet military and space exploration programmes.

Recent political watersheds include its breaking free of Soviet rule and loosening centrally-planned economic management structures in 1991, and populist rejection of corruption in high political office and property acquisition by oligarchs through the ‘Orange Revolution’ in 2004. At the time of writing, Ukraine stands on the verge of an economic crisis, having recently been in receipt of a third tranche of emergency financing from the International Monetary Fund (IMF). Moreover a clear political consensus and policy mandate has failed to materialise in Parliament in the post Orange Revolution era, rendering the institutional and regulative infrastructure for business brittle and evanescent.

Ukraine has been classed as an emerging software exporting nation (Carmel & Tija, 2005), its status having been primarily derived from its convenience as a nearshore location for companies operating from the eastern part of Western Europe. In terms of the global pecking order of software exporting nations, Ukraine continues to lag behind India, Ireland, Israel, China and Russia, whose engineers have ascended the value chain...
to provide more ‘architectural’ and specialist functions, Despite its status as the former ‘IT Republic’ of the Soviet Union, Ukraine continues to provide only ‘generic’ skills for the international software industry (Carmel & Tija, 2005), reinforcing a pattern of asymmetry between Western companies located in IT ‘nerve centres’ and Ukrainian vendors.

The following statement, from a report by the American Chamber of Commerce in Ukraine, is optimistic with regard to the potential integration of Ukrainian engineers into the global reservoir of high technology skills;

_Ukraine inherited its educational system from the Former Soviet Union, which consistently graduated highly qualified students in applied sciences such as mathematics and physics. A large part of their training today includes software development and many of them take their logical skills and use them in a career as a software engineer. Ukraine boasts a 98% literacy rate with 87% of high school graduates going onto higher education. Of those 35% choose information technology related disciplines … Because of low demand in the domestic market for research and development in mathematics or physics, former researchers are also looking to commercialize their talent and technology they have been developing over the years. This provides a wealth of undiscovered talent and technology in Ukraine, which can be applied to the systems and applications being developed by US companies._ (American Chamber of Commerce in Ukraine, 2002:12)

It may be argued that three primary institutionally-based factors have hampered Ukraine’s integration into global economic structures, which have in turn affected its relative status as a software exporting nation.

Firstly, as a legacy of Soviet centrally-planned economic management, a deficit in ‘Western style’ managerial skills exists. Fuxman (2004) describes the management ethos still apparent in a majority of Ukrainian organisations as follows;

_The ‘Soviet’ model is a vertical management structure that is typically oriented towards fulfillment of all orders from upper levels of management. Under this model of operation, management does not have to be aware of, or concerned with, the overall goals of the organisation. At each organisational level, orders are typically dispensed from immediately above without much co-ordination with other departments. This frequently leads to products or work that do not fulfil customer requirements, hence resulting in the loss of many customers._ (Fuxman, 2004:29)

Secondly, despite its possession of significant technological talent, institutional instability in Ukraine has led to a failure to harness its potential contribution to drive indigenous economic renewal and innovation. Makogon et. al. (2009) argue that slow innovative development is a result of the absence of an understanding, at macro political level, of markets and market relations, as manifested in low levels of trust between inventors and governmental authorities. These authors also report a tax regime which is punitive to entrepreneurial start-ups and a business environment characterised by depopulation and the existence of a social underclass which acts as a drain on welfare resources.

Thirdly, as Rodgers, Williams and Round (2008) state, rather than experiencing a smooth transition to market-based systems, Post-Soviet economies are marked by oligarchy and corruption. According to these writers it has been inevitable that systems of
'economic involution' (Burawoy, Krotov & Lykina, 2000), ‘chaotic capitalism’ (Lane, 2000) or ‘virtual economies’ (Gaddy & Ickes, 1998) have developed in these regions.

In such a milieu, drawing on a survey of the informal sector in four Ukrainian localities, Williams and Round (2009: 45–46) found that informal work is a ‘ubiquitous and omnipresent’ feature of the economic landscape, representing a vital means of securing a livelihood for most households. The informal economy in Ukraine does not merely remain the preserve of those ‘decanted’ from the formal economy, but is also a necessary means of economic consolidation for the vast majority of those engaged in the formal sphere of economic activity (Williams & Round, 2009). Unfortunately, the informal economy is renowned for widespread unlawful activity, including tax evasion by employers and employees, corruption, theft of company property and misappropriation of resources. An undoubtedly common practice is the use of company time and resources by employees to undertake informal work (Rodgers, Williams & Round, 2009). While such activities may be regarded as ethically suspect from a Western perspective, they continue as manifestations of a state of affairs evident in the socialist era in which ‘formal and informal normative systems ran parallel to each other’ (Pistor, 1999:106). Indeed, as Williams (2007:221) asserts, from a neo-liberal perspective, undeclared workers constitute ‘heroes casting off the shackles of an over-burdensome state’ and manifest ‘real business acumen, creativity, dynamism and innovation’ (ILO, 2002: 54). In Ukraine, the vast majority of those engaging in undeclared work are self-employed, starting businesses on a cash-in-hand basis, and shifting their trade into the legitimate sphere once they have become more established (Williams, 2007).

According to the American Chamber of Commerce (2002), informality impacts significantly on the software development sector, approximately 90% of software development in Ukraine being informally organised. Indeed it may be argued that the ICT labour market in Ukraine exemplifies a new and pronounced trend in global productive processes whereby formal enterprises have been increasing their involvement with informal labour through outsourcing and subcontracting in developing countries (Ward & Pyle, 2000; Standing 2006).

**Research methodology**

From September 2009 to January 2010, following an extensive search of existing data pertaining to the status of ICT offshoring in Ukraine, including survey evidence published by Northampton Business School, UK (2002), the American Chamber of Commerce in Ukraine (2002) and the consultants Munk, Andersen and Feilberg (2008), we conducted in-depth semi-structured interviews with a total of eleven managers at CEO or equivalent level, based in the UK, Scandinavia and the USA to gain insights into their strategic rationales for nearshoring to Ukraine and the major challenges they encountered in implementing these projects in practice. Major questions related: first, to the primary strategic drivers stimulating international sourcing of software development; second, to the reasons for selecting Ukraine as a suitable offshore locality for software development; third, to their perceptions of the risks assumed through embarking on such a programme of international sourcing; fourth, to the particular issues associated with operating in Ukraine, particularly in the field of employment;
and fifth, to their approaches towards, and perceptions of, the challenges associated with 'managing across distance'.

We followed up this course of interviews with a visit to Ukraine in September 2010, during which we conducted interviews with CEOs/owners and representatives of management teams in four leading vendor organisations and one self-employed consultant engaged in providing offshore software development services. We were also provided with the opportunity to interview a select group of Ukrainian software engineers as a focus group. The purpose of these interviews with Ukrainian participants was to gain a grounded insight into the realities of managing and working as nearshoring operators from the Ukrainian perspective.

The bulk of our fieldwork was concentrated within the relatively small constituency of Ukrainian software development providers operating in the formal economy.

As the American Chamber of Commerce in Ukraine (2002) states, there are more than 200 offshore software development services companies in Ukraine, most of which fall into two categories.

The first of these categories comprises organisations with 50-300 programmers, partly or fully foreign-owned, or 100% Ukrainian-owned, but which do most of their work for foreign clients and contractors. These organisations often have well-developed management structures and, in the case of contractors, have sales and marketing organisations worldwide. This sector constitutes approximately 10% of the total population of offshore software providers.

The second category consists of organisations with 10-20 programmers doing smaller jobs and obtaining their contacts through friends and acquaintances abroad within the Ukrainian Diaspora. Most of these organisations keep much lower profiles and many are not even officially registered.

Our fieldwork had several noteworthy characteristics. Firstly, the companies to which we had access could be regarded as exemplars in the formal nearshoring sector. Secondly, for many of these concerns we gained access to managers at CEO/owner level, thereby lending considerable authority to the expositions that were forthcoming. Thirdly, three of the Ukrainian vendors to which we gained access serviced clients who had participated in earlier stages of our fieldwork. This enabled us to corroborate and contrast home-and host-country perspectives in specific organisational cases of international sourcing.

Our sample of ICT companies in the West was gained from a database held at our home university, through personal contacts and through the Ukrainian Outsourcing Directory. All interviews were conducted in English (as all the managers and engineers participating in our survey were fluent in this language) and were recorded and transcribed. In order to safeguard the confidentiality of participant companies, no actual company names are used in our reporting below.

**Results**

For all respondents in our study, the primary motivational driver for embarking on the strategy of international sourcing of software development related to cost effectiveness, and particularly the possibility of achieving labour cost arbitrage. It was stated by a
number of our interviewees that labour costs for skilled engineers in Ukraine were at least one half of that of equivalents in the USA or UK. Nevertheless, a vital and concomitant factor driving offshore outsourcing was the availability of reservoirs of advanced engineering skills in offshore localities.

Turning to the question of ‘why Ukraine?’, the majority of our respondents stressed the advantages of physical proximity, enabling easy travel, time zone closeness and, to some extent, cultural similarity. This was particularly attractive for smaller software companies with limited resources. Typically, when those companies engaged in nearshoring had completed the initial contractual formalities, the company headquarters relinquished the obligation to deal with Ukrainian bureaucracy and regulative effects, typically transferring these, along with their associated risks, to third party vendors. Something of a ‘shoal’ effect was apparent in the geographical preferences of Northern/Western European companies engaged in nearshoring. Informal, word-of-mouth communications within the ICT managerial community had apparently created a ‘buzz’ concerning the merits of investing in this post-Soviet republic. Certainly, few of the CEOs or owner-managers we interviewed had appraised the strategic costs and benefits of establishing operations in Ukraine in a highly systematic or measured fashion. Indeed ‘gut feeling’ had guided this regional investment decision in a number of instances. Participants recognised that Ukraine offered a favourable ‘window’ in current productive and market circumstances, yet that patterns of global organisation of software development were transient by nature. Two of the vendor companies we visited in Ukraine were Danish-owned and were being run by an in situ Danish owner. One was a large international company originating from India and the USA, while another was distinctive in being Russian-owned. None originated from Ukraine. The outward focus of all vendor concerns was evident, as services were invariably provided for clients in Western locations.

Turning to perceptions of the risk inherent in operating in a geographically proximate, yet institutionally distant, environment, a number of respondents mentioned the issue of potential intellectual property leakage from the offshore units. A further, and perhaps more significant, hazard related to the cultural complexities and ambiguities associated with international working, albeit across geographically near territories. Therefore, although the Ukrainian engineers were generally proficient in the English language, examples of misinterpretation were not infrequent. One instance related to an expatriate manager greeting a Ukrainian employee with a platitudinous ‘How are you doing?’, the latter finding this question pointedly intrusive. More generally it was felt by Western headquarters staff, that Ukrainian workers were less committed to the goals and values of the organisation, and to client needs, than their Western counterparts. This was manifested, in particular, by poorer levels of employee motivation, less preparedness to work beyond the terms of the contract, and an excessive (in the eyes of nearshoring companies) priority being attached by the engineers to ‘time out’ commitments, such as birthday parties or family events.

Headquarters managers were at pains to ‘normalise’ relations with geographically dispersed staff. One of the Western-based CEOs of a Ukrainian offshore operation used the unfortunate Silicon Valley expression ‘Bite off the head and swallow the body’ to
explain the emerging structure of Ukraine-based software development operations, referring to the process of acquisition of previously local companies in which indigenous managers were discharged and engineers integrated into a company headed by Western proprietors. This managerial construct was replicated in the majority of the Ukrainian companies we visited, reflecting the deficit in Ukrainian managerial or entrepreneurial skills, although invariably in situ Western senior managerial interests were supported by a cadre of select Ukrainian management ‘anchors’ or team leaders.

The staffing resource of such companies is regarded as a vital organisational asset, the typical engineer being young, university-educated, English-speaking and predominantly, but not universally, male. A pivotal organisational feature in such offshore operations was the establishment of ‘agile’ teams. The notion of agility possesses particular significance for project-based offshoring activity because semi-autonomous teams are charged with seeing one-off client-generated requisitions through from inception to completion. ‘Scrums’ of engineers, with a supervisory team leader, undertake to time-manage projects in order to meet the deadlines defined by clients and are rigorously monitored by corporate headquarters. Through the course of team-based projects, members engaged in direct interaction with clients, typically by virtual means, in order to rectify technical problems and, where necessary, renegotiate elements of the specification. Team leaders are vital actors in the implementation of human resource policies, for example in deciding performance-related rewards for individual team members.

Nearshoring companies emphasise reliability and quality of service delivery in securing their market niche. To meet such concerns there is a need to secure the engagement of a committed and relatively stable team of local engineers, and it was desirable to project a positive image of such teams to potential and actual clients through company web sites and similar publicity materials. In fact, however, the presentation of stability in such workforces is somewhat illusory because team members could be attached to various client projects simultaneously, and staff turnover rates tend to be high. As a measure to circumvent the bureaucratic regulatory environment and to retain skilled workers, a number of companies had taken advantage of a legislative opt-out allowing employees to be paid in euros, and for pension and social security taxation levies to be waived.

In common with other researchers in the field (see, for example, Cramton, 2001; Mannix, Griffith & Neale, 2002; Mayer-Ahuja & Galvin, 2003; Kankanhalli, Tan & Wei, 2007) we discovered that nearshoring companies devote considerable attention to ensuring co-ordination across internationally dispersed sub-units straddling different temporal, language and cultural zones. Here, important methods for fostering a shared corporate identity and effective knowledge sharing include face-to-face as well as indirect contact through electronic media.

A number of companies have established policies aimed at engendering high commitment on the part of the Ukrainian engineers. According to one CEO;

*They [the employees] need to feel part of the company ... you need video conferencing, reviews that everyone can understand, a department that does a newsletter, offsite person-to-person meetings. If you do all these things it works well.*
Typically, ‘cultural indoctrination’ (as one CEO described it) occurred in an incidental fashion as technical problems were resolved continuously in virtual cross-functional and cross-national teams. Nearshoring organisations had recognised the potency of corporate brands and symbols in engendering employee loyalty and commitment. Such companies also typically formulated rigorous, frequently on-line, recruitment procedures, with CEOs often being directly involved in the selection of engineers. Individualised and sophisticated performance appraisal systems were also common.

During our visit to Kiev it was instructive to observe the physical design and sense the ambience of nearshore facilities in Ukraine, which manifested the trappings of ‘soft capitalism’. One site, for example, had been a former communist party building and exhibited a sombre and imposing architectural structure from the outside. Inside, the youthful ‘knowledge workers’ populated an open-plan office and clustered around advanced computer terminals. Unrestricted access was also provided to a coffee lounge in which a television broadcast non-stop news bulletins from the UK on a satellite TV. At another site, a gym and bar were provided on the premises and the young software developers were provided with scooters to render frequent movement from terminal to terminal pleasurable and exciting. While such environmental observations may appear trivial, they possess important symbolic value in eliciting the emotional buy-in of young and gifted Ukrainian engineers anxious to achieve normalisation and rehabilitation in the new global order. Such socialisation techniques, which are concerned with conditioning the psyches of staff, rather than upgrading their technical skills, may possess considerable potency in Ukraine, as in other marginalised former socialist regions, where the younger generation is anxious to achieve normative integration with counterparts in the Western world. (see, for example, Collin, 2001).

Intriguingly, one of the companies we encountered during our visit, while being formally located in the formal economy, in practice straddled formal and informal sectors in a hybridised and opportunistic fashion. The case we encountered was managed and owned by a Danish entrepreneur based in Kiev. Although the primary geographical focus of this company’s marketing strategy was towards Scandinavia, a sales force had been more widely deployed in Western Europe and potential clients in Russia were also being targeted. A primary corporate concern was cost effectiveness, with the company essentially acting as a recruitment agency, providing specialist teams of engineers on demand for Western clients, and having at its disposal a large potential workforce of 750 contractors. The management team also offered paid ‘consultancy’-type services to clients to facilitate direct and expeditious ‘lock in’ between clients and engineers over the duration of projects. The client-engineer relationship was primarily individualistic in nature, each party being subject to termination if established performance criteria were not met. Indirect costs were evaded through minimal managerial intervention and avoidance of the creation of ‘unnecessary’ managerial hierarchy.

This offshore provider recruited its staff from the Ukrainian labour market at large, rather than an elite group of University graduates, which tended to be the primary labour market source for most of the enterprises described above. Reflecting the ubiquity of the informal labour market in Ukraine, this provider unapologetically recruited engineers from IT enthusiast clubs in the region, for example tapping
into a ‘Smart Phone’ community with 600 members. The company had consciously sought to nurture this extensive skill-set by hosting Thursday evening gatherings and establishing online platforms and virtual chat rooms.

As we have argued above, the ‘high road’ to re-engineering the international labour process for software development is marked by considerable complexity, risk and cost. It is for this reason that many offshoring software operators have been considerably less scrupulous in organising labour processes than the relatively few companies operating in the predominantly formal sector of the market as we have described above. ‘Body shoppers’ take a considerably more instrumental and ruthless approach to minimisation of risk through the deskilling and extreme intensification of offshore work. As the American Chamber of Commerce in Ukraine (2002) points out, many smaller software operators in Ukraine have gained their contacts through friends and acquaintances abroad via the Ukrainian Diaspora, and are frequently operating on the ‘black market’. Many engineers attached to such concerns are operating on a self-employed basis, and a highly individualised approach is adopted by the sourcing entity to the exploitation of the labour resource.

While access for researchers into the informal sector is understandably difficult to obtain, we were able to gain first hand insight into the management and employment practices evident in the informal software development economy in Ukraine by interviewing a CEO based in the USA whose business had recently ‘gone legal’. This company possessed no physical facility in Ukraine and its engineers were required to purchase their own computers and work from their homes. All of the company’s major business functions were located in the USA. The company employed one ‘team leader’ in Ukraine, who was a member of the stock option plan, but all other IT staff (24 programmers, six processors and twelve testers) were categorised as self employed or subcontractors and responsible for paying their own taxes. The company’s IT workforce was recruited via the Internet, executed prescribed tasks online, and was subject to rigorous, technologically-based performance management. Programmers required around six months of training because they needed to learn approximately 200,000 pieces of code. This category of staff represented a considerable investment, and previous problems relating to their rates of turnover had been resolved by increasing their salaries. The CEO in question described the work system as follows:

The entire company is virtual. Employees are very closely monitored—we use email, Skype and instant messaging. We track them by the numbers. We estimate in advance how long each task should take, and if a programmer is consistently taking longer to do a task, they are either padding out or not doing a good enough job and we let them go. Our model is totally streamlined towards efficiency. All the video stuff is really gratuitous. These people are here to get a job done. They don’t care what we look like and we don’t care what they look like. We cater for a certain type of programmer who wants to work out of home and have flexible hours rather than someone who wants to go into an office and have someone sit around and talk to them. We rely on headhunters for recruitment and don’t deal with universities as that would be a lot of upfront work. It is very fluid. You can find a programmer anywhere in the
world. If one country is too expensive you just go to another country. What is interesting is that the Internet is going to drive more and more models like ours.

Discussion

It is clear from our study that the software development process has been subject to ‘vertical disintegration’ in order to capitalise on differentiated inputs (Sako, 2005) on a regional basis. The particular focus we have placed on Ukraine as an offshore location for software development has brought to the fore the salience of labour cost arbitrage derived from highly distinctive labour market circumstances (incorporating both formal and informal economies) as a catalyst for inward investment by Western-based software entrepreneurs, as well as the potential to reap rich reserves of post-Soviet engineering talent. In seeking to further systematise the notion of embeddedness, and to understand motives for relocating components of the software development value chain to Ukraine, we have formulated a simple taxonomy (Hardy & Hollinshead, 2011) encapsulating three main types of embeddedness: structural, cognitive and cultural and network embeddedness.

Structural influences on embeddedness were apparent through the precise knowledge the software companies possessed of wage costs and fully-loaded costs per hour, and the evident entrepreneurial attractions of leveraging high knowledge levels at relatively low cost. The geographic proximity of Ukraine to ICT ‘nerve centres’ in Northern and Western Europe also represented a compelling rationale for the relocation of lower-level productive and service-providing functions to the region. However, it is also evident that structural embeddedness in the Ukrainian context is fragile and transient in nature. The devolution of production in software development had taken place in a series of phases, with a variety of global regions occupying different points in a cycle. As wage costs increased in one country, then lower cost destinations were sought, and therefore relative comparative advantage was relatively short lived (Hardy & Hollinshead, 2011).

Cognitive and cultural influences on embeddedness related to the tendency for the inward investors to target the skills of specific teams of engineers in Ukraine in a highly specific fashion. There was little evidence of horizontal integration of the companies concerned in wider Ukrainian economic or political structures. Without the support of external institutions, for those enterprises operating in the formal sector of economic activity, highly sophisticated and internal corporate ‘soft capitalist’ human resource policies were invariably required in order to capitalise on the tacit and advanced engineering knowledge embedded in teams. ‘Agility’ represented a critical corporate competence, with teams of Ukrainian engineers being required to connect with, and respond to the changing demands of Western consumers on an ongoing and flexible basis. At the other end of the strategic spectrum, extreme engineering or ‘body shopping’ required little or no normative inculcation to be exerted by Western based software entrepreneurs, and the skills of Ukrainians were utilised in a highly individualistic and instrumental fashion.

Finally, network embeddedness was related to the ‘kaleidoscopic’ quality of Ukrainian-based networks (Hardy & Hollinshead, 2011) in terms of the temporality of
organisational forms, the centrality of teams, and the place of the Ukrainian operation in the GCC. Many of the high-tech start ups were funded by venture capital, on the basis of a single product, and if that product were unsuccessful then the company would become defunct. We encountered examples of former employees of one firm starting their own firm, but remaining subcontractors on the books of the original company. Moreover, the notion of teams of engineers appeared somewhat illusory and evanescent, with various collections of individuals reconfiguring around different projects in the same enterprise, or even straddling different enterprises across formal and informal sectors of software development activity. However, with regard to its place in the value chain, the process of software development and production in Ukraine invariably lay at the lower levels, with higher-end activities located in the headquarters of parent or user companies in more advanced economies. We did, however, observe rapid growth and learning amongst teams of software engineers in the formal sphere of Ukrainian software development activity.

Conclusion
While our study is undoubtedly limited in terms of its empirical base, representing a relatively small number of companies and drawing primarily on the views of senior management, it nevertheless has served to highlight certain paradoxes associated with international organisation and management in the era of globalisation. The focal sector of analysis, software development, is frequently depicted as footloose, fluid and free-wheeling. In many senses the industry may be characterised as uniquely symbolising the core cultures and values of a new, emergent and potentially equalising world order. In subjecting the spatial re-organisation of software development through nearshoring to empirical scrutiny we reveal that, in practice, the industry is characterised by a marked status differential separating architecture/design from more routine functions. This phenomenon is becoming geographically extended as the industry internationalises, with primary design activity and marketing remaining in the Western centres of expertise, and subsidiary functional activity being dispersed to hitherto relatively ‘unknown’ zones.

From the perspective of IT capitalists, while geographical dispersion of organisation reduces costs, it simultaneously increases risk, because distant employees possess less innate identification with the corporate brand and clients, and staff attrition carries with it the potential hazard of intellectual property leakage. The offshoring companies we studied had all been ingenious in devising strategies to exert control over distant employees, strategies that mirror tried and tested managerial systems for controlling the labour process in the domestic setting. Accordingly, at one end of the spectrum of offshore business models, companies engaged in international sourcing have traded on the myth of the knowledge worker, and have gained employee buy-in through the dissemination of corporate values and virtual interactive techniques. At the other, a more ruthless and instrumental system of international managerial control has been asserted, via the Internet, over individuals at their home computer terminals, typically operating on an informal basis. When, therefore, the glamorous casings of the software industry are stripped away, and the observer looks ‘inside the box’, the myth of the
knowledge worker gives way to a far more archaic, but now internationalised, model of industrial production.

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