



Routinizing the offshore choice: applying diffusion of innovation to the case of EDS

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offshore choice

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Abstract

Purpose – We treat offshoring as a *managerial innovation*. Should it still be considered an innovation? The purpose of this paper is to use innovation theory, especially, Rogers' diffusion of innovation theory (DOI) to examine this question.

Design/methodology/approach – The paper examines the case of electronic data systems (EDS), a very large Information Technology Professional Services (ITPS) company, using a case study approach based on interviews, internal documents and secondary sources.

Findings – At EDS it was found that offshoring has been fully assimilated within just a few years. During the early 2000s, EDS faced the challenge of a large-scale shift in the competitive landscape and moved a large share of its global operations to offshore locations. The paper shows how this innovation has been diffused within the firm through the creation of an assessment and migration organization that has institutionalized and routinized the process of offshoring. At EDS, each client project goes through a centralized offshoring assessment process to determine where best to send the work and how to perform the knowledge transfer quickly and effectively. Observations are made about the speed of diffusion: about 7-10 years in this case, from initial innovation agenda setting to its routinization.

Research limitations/implications – This paper filled a gap in studying managerial innovation; made some estimates of the speed of diffusion; and applied the hypothesized stages of innovation diffusion to the context of offshore software services. The limitation is that this is a case study and therefore generalization may be qualified.

Originality/value – This paper is among the first that studies offshoring (as opposed to outsourcing) in terms of DOI theory.

Keywords Innovation, Diffusion, Communication technologies, Professional services, Globalization

Paper type Case study

1. Introduction

The explosion of interest in offshoring has occurred at least in part because offshoring is an innovation that is creating challenges and opportunities for firms and workers in both developed and developing countries. An innovation is “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p. 12). Offshoring is a *managerial innovation*, i.e. “invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended for further organizational goals” (Birkinshaw *et al.*, 2008), in the same

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category as business process reengineering (BPR) or total quality management (TQM). In this analysis, the unit of adoption is the firm.

When an innovation is first introduced into an organization, potential users become aware of it, experiment with it, learn to use it, adopt it, and become proficient at it. After a certain amount of time the innovation becomes assimilated and routine. It is this routinization of offshoring that we examine in this paper.

In this paper we examine the case of electronic data systems (EDS), a very large Information Technology Professional Services (ITPS) firm, and show that offshoring has been assimilated in a relatively short time through institutional and process changes, and has already become routine. Our research question deals with how an innovation like offshoring gets fully diffused within such an organization. During the early 2000s, EDS faced the challenge of a large-scale shift in the competitive landscape and moved a significant portion of its global operations rather rapidly to low-cost offshore locations. We will describe the elements of organizational and process changes which helped to diffuse this business innovation within the firm.

At the time of our study, major ITPS companies had been expanding offshore for a number of years. Already in 2004, one finds this description in the leading American trade publication, *Computerworld*:

[The Indian ITPS firms had been growing and . . .] At the same time, US-based providers are expanding their offshore operations to cut costs. [. . .] For users of these services, the twin developments likely will mean increased competition – and potentially better pricing – as offshore development becomes a standard part of any outsourcing offering by US-based companies. [. . .] The differences between [American] and offshore IT services firms are blurring [. . .] (Thibodeau, 2004).

And four years later the assessment of offshoring as routine is more explicit in the same publication:

This big shift in jobs to low-cost offshore locations may be accelerating, in part, because companies are more experienced – and comfortable – with offshoring and have developed standardized practices [. . .] (Thibodeau, 2008).

2. Literature

While the topic of *outsourcing* has been studied quite extensively in the information systems field (see Dibbern *et al.*, 2004 for a review), researchers have only recently begun to empirically examine the factors that influence *offshoring* of IT. Recent research on factors that influence the location of knowledge work have identified economic factors, the nature of the activity being sourced, and the capabilities of client and vendor firms (Dibbern *et al.*, 2008).

Economic factors include labor cost differences across countries, availability of skilled workers, and desire for access to foreign markets (Sobol and Apte, 1995; Metters, 2008). In terms of the nature of the activity itself, Tanriverdi *et al.* (2007) find that the offshore sourcing decision for business processes depends on the modularity and IT detachability of activities in these processes. Mithas and Whitaker (2007) find that the global disaggregation of service occupations depends on the ability to modularize, codify, and standardize the activities involved in those occupations. Others have identified complexity, process maturity, and customer contact requirements as important characteristics of the activity (Hirschheim *et al.*, 2007; Youngdahl and Ramaswamy, 2008).

Capabilities have been defined as “a distinctive set of human resource-based skills, orientations, attitudes, motivations, and behaviors that have the potential...to contribute to achieving specific activities and influencing business performance” (Willcocks and Feeny, 2006, p. 49). Others focus on business practices affecting the performance of offshore software development. Ramasubbu *et al.* (2008) find that structured software processes combined with process-based learning activities can enhance the performance of offshore software development projects. Levina and Vaast (2008) find that differences in country contexts inhibit the effectiveness of cross-border software development teams.

In contrast to these studies, which focus on factors affecting firms in general, we are interested in the diffusion of offshoring as a practice within a particular firm. We are particularly interested in the interplay of the offshoring decision with the way that the practice of offshoring is implemented within an organization. We approach this study through the lens of diffusion of innovation (DOI) theory. We treat offshoring as a *managerial innovation*, i.e. a new way of doing things – a new process – within the adopting organization.

One branch of DOI theory has emphasized the stages of innovation adoption in organizations as opposed to among individuals, from initial awareness through complete assimilation (e.g. Tornatzky and Klein, 1982; Rogers, 2003). In this vein, we analyze a detailed case study of offshoring in one firm in order to understand how the innovation of offshoring is implemented, assimilated, and ultimately routinized within the organization.

This question is interesting in its own right as a study of innovation adoption. It also has larger implications for understanding the extent to which knowledge activities, in this case software development services, can be relocated to lower cost locations such as India. The offshoring decision is driven by economic factors, such as cost reduction or access to skilled workers, but can be inhibited by difficulties in managing the process, such as transferring knowledge, overcoming cultural differences, and coordinating work flow across multiple time zones (Carmel and Tjia, 2005). As offshoring becomes standardized and routinized, these obstacles begin to fall away, and decisions can be made primarily on economic factors, which will favor even more offshoring as long as the cost differences remain large enough.

Rogers (2003, p. 420) defines five stages in the innovation process within an organization:

- (1) agenda setting;
- (2) matching;
- (3) redefining/restructuring;
- (4) clarifying; and
- (5) routinizing.

The first two are grouped as the initiation sub-process; the last three as the implementation sub-process. Our case study concentrates on the latter. We do not treat these stages necessarily as sequential stages, but rather as three elements of implementation. We discuss each of these implementation stages in detail.

Stage (3), *redefining/restructuring*, is the element in which the innovation is modified to fit the organization, and organizational structures are altered to adapt to the innovation. In this stage, we do not see the innovation or the organization as fixed entities that either fit or do not fit; rather, innovations can be adapted to existing

organizational arrangements, and can also transform the structure of these arrangements (Van de Ven, 1986). This is consistent with the view of technology as a social construction whose meaning is a product of human interaction, rather than an objective external object (Orlikowski, 1992).

As part of the organization's adaptation to an innovation, new organizational structures may be created to lower barriers to adoption. These can take many forms, such as external consultants or other experts (Attewell, 1992), or in other cases, new internal units such as total quality circles or Six Sigma black belts. These structures not only provide knowledge to facilitate assimilation, but also can act as innovation champions to drive assimilation.

Stage (4), *clarifying*, occurs as an innovation gains widespread use in the organization and the meaning of the innovation becomes clearer to the members of the organization (Rogers, 2003, p. 427). In the case of offshoring, there is a great deal of concern over how to decide what work is offshored vs kept at home and what this means for business units, individuals, and jobs.

The final stage, Stage (5), is *routinizing*, which Rogers says "occurs when the innovation has become incorporated into the regular activities of the organization, and the innovation loses its separate identity. At that point, the innovation process in an organization is complete" (Rogers, 2003, p. 429).

Fichman (2001) defines routinization as "the extent to which an innovation has become a stable and regular part of organizational procedures and behavior." In these definitions, routinization is more a state of being or an endpoint rather than a process. Similarly, Zhu *et al.* (2006) distinguish between adoption and routinization as stages in innovation diffusion in their empirical study of e-commerce, and treat routinization as a dependent variable measured by extent of e-commerce usage. Yet in our case study, there are actions taken by the firm that can be best defined as a *process* of routinization, e.g. setting up a series of steps that each new project goes through to determine which activities are to be done offshore.

A related term to routinization used in the literature is "assimilation" (Meyer and Goes, 1988; Fichman and Kemerer, 1997), which refers to how extensively an innovation is used and how deeply the organization's use of the innovation alters processes, structures, and organizational cultures. Fichman and Kemerer (1999) argue that there is an "assimilation gap" between adoption and assimilation of IT in many firms. This reflects the time period in which the innovation is being implemented (Stages (3)-(5) in Rogers' chronology), and the speed of assimilation that is one focus of our case study.

Next we move to a typology of innovation. Zmud (1982) distinguishes between technical and administrative innovations within the IS unit. Robey (1986) uses three types: new products (or services), administrative innovations (improving internal control, coordination, and structure), and technical innovations (changes to technology or work processes).

Swanson (1994) also has three innovation types. Type I innovation is an innovation confined to the IS task; Type II innovations support administration of the business, and Type III innovations are imbedded in the core technology of the business. Within Swanson's innovation topology, *offshoring* is clearly a Type I innovation, specifically a Type Ia innovation that focuses on the administration of an IS task (in this case application development). It does not deal with the technology itself, nor is it an information system. EDS, the case study firm, does not use IT in any unique ways that we could identify; the innovation was organizational – a Type I innovation. We have

chosen to depart slightly from Swanson and Robey and instead use the terminology of Birkinshaw *et al.* (2008) and label this innovation a *managerial innovation* rather than an administrative innovation. This reflects the fact that offshoring is a managerial practice with broad managerial implications, not simply an innovation that deals with administration of a task.

In conducting the literature review, we note some gaps, or weaknesses in the application of DOI to the IS field. First, prior research has tended to focus on the early stages of the diffusion of IS innovations. As Mustonen-Ollila and Lyytinen (2003) note, one reason for this is that many organizations do not fully diffuse the innovations, so sometimes there is little to study in the latter stages. In addition, many academic studies of IS innovations focus on the IT artifact and on innovations within the IS unit rather than IS innovations affecting the organization more broadly (Swanson, 1994). Also, while DOI theory has been applied to *outsourcing* (e.g. Vitharana and Dharwadkar, 2007; Galanaki and Papalexandris, 2007; Palmer and Dunford, 2001), we found no articles addressing *offshoring* as a DOI issue.

3. Research methodology

Our approach is based on field data from a major and influential participant in the offshoring domain. We used a case study approach to capture the experiences and context of actors directly involved in the offshoring process (Benbasat *et al.*, 1987; Eisenhardt, 1989).

We were given very high-level access at the offshore management unit of EDS. Through this access, interviews were set up with many managers per our requests. For example, after the initial interview we asked to speak to individuals who were working on the offshoring assessment process; one in London, another in the USA.

All the interviews were conducted by voice. Seven high-level executives were interviewed, most of them more than once. Usually, more than one person participated in these small group interviews. There were five major interviews totaling 7 h. Most of these interviews included the Managing Director of application services of EDS *Best Shore* (Best Shore is EDS's global network of low-cost locations also an EDS trademark). In addition to interviews, we were given access to important written materials. All data were collected in 2007, well before the economic crash of 2008, and before HP's acquisition of EDS in 2008.

Our research focused on the offshore decision and its implementation. The interviews utilized a common semi-structured protocol. The questions were structured loosely around four category groupings:

- (1) economic factors of offshoring (costs, benefits, risks);
- (2) relational factors (e.g. proximity);
- (3) ICTs and other coordination mechanisms; and
- (4) organizational outcomes and firm performance.

We had defined these category groupings and their individual topics from our prior literature review (Sobol and Apte, 1995; Willcocks and Feeny, 2006; Banker *et al.*, 2006).

We used snowball sampling, where each interviewee was asked who best to approach in the organization for confirming, conflicting, or new (and usually more detailed) information. The questions also were refined over time as ongoing interviews revealed new issues to explore. All the interviews were transcribed and categorized to

look for patterns among responses. From these patterns, a set of empirically based findings was developed.

4. Background on the case study firm – EDS

At the time of the case study in 2007, EDS was one of the four largest ITPS firms (IBM, Accenture, CSC, and EDS) that were far larger than any of their global competitors. EDS had about 117,000 employees worldwide in 57 countries.

In order to remain competitive with its global competitors, as well as major Indian ITPS companies, EDS had been growing its own offshore resources in India, China, Argentina, Egypt, and elsewhere. EDS refers to these locations as “Best Shore” sites. To support this strategic goal, in 2006, EDS completed the acquisition of India-based Mphasis. The purchase of one of the largest companies in the Indian IT services sector added 11,000 India-based employees. The company’s expansion of offshore locations was not unique to EDS, but reflective of the activities of all the Big 4 as reflected in Table I.

Within EDS our case focused on the Application Services Division (ASD), which overall had 40,000 employees – of which Best Shore was one part. ASD focuses on custom systems, while other EDS divisions cover infrastructure outsourcing and business process outsourcing (BPO).

EDS was organized in somewhat of a basket-weave matrix organization. ASD was organized both by industry verticals (finance, manufacturing, health, communications, transportation, energy, government), as well as geographical region (the Americas, Europe, Middle East, Asia-Pacific). Best Shore was distinct from the rest of ASD in that it was focused on low-cost countries anywhere in the world.

By 2003, EDS had a global offshore network of 18 Best Shore locations to deliver low-cost services. This network was consolidated somewhat in the years that followed and by the time of this case study, it was focused on the locations in Table II. Nevertheless, additional locations were always being sought out due to the changing nature of supply and demand.

5. The case study data

EDS has organized its ITPS into a hierarchical structure, often called a three-tier structure: onsite, onshore, and Best Shore. Onsite is when the staff work at the client site. Onshore is when specialized staff support the onsite team within the same country

IBM	In May 2007, IBM India had 53,000 employees. IBM was planning to grow to 120,000 employees in India by mid-2008 (Bonasia, 2007)
Accenture	In January 2007, Accenture India had 27,000 employees and announced it would increase the number of employees in India to 35,000 by August 2007. This would exceed the number of US employees (30,000), making India the largest employee country for Accenture (Chatterjee, 2007)
EDS	After the acquisition of Mphasis in June 2006, EDS had a combined 15,000 employees in India. In 2006, EDS announced that it would increase the number of Indian employees to 20,000 by the end of 2007 (The Hindu Business Line, 2006)
CSC	CSC acquired Covansys in July 2007 and First Consulting Group in January 2008, doubling its employees in India by October 2008, with 19,000 out of 90,000 total employees, the largest concentration of employees outside the USA (Datamonitor, 2008)

Table I.
Large ITPS movement into India as the principal offshore nation, 2006-2008

or region (for instance, a client from Oklahoma is supported by the larger office in Texas). Best Shore takes place when less expensive offshore staff can perform the tasks from low-wage nations. To an increasing degree, the staff are not just generic programmers, but offshore teams organized by technology capabilities, and more and more by industry specialization.

The EDS offshore decision process increasingly revolved around an internal unit called the Assessment and Migration Office (AMO). The AMO worked with EDS business units to decide what work to offshore, where to locate the work, and how to manage the migration. Furthermore, the AMO took it upon itself to develop a suite of delivery models to standardize and improve the migration process. This office was mandated to be involved in all migrations above a certain threshold (ten employees), and was expected to work with the relevant business unit to ensure that all potential offshore opportunities were identified (including opportunities internal to EDS) and to assist in the migration process.

The AMO opened in late Q4 2006. By the middle of 2007 this unit had managed 34 migrations (involving 1,100 FTEs – full time equivalents) of which about a third were already complete. The tasks of migrating IS work from a client to a new location was not new to EDS. EDS had been doing offshore migrations (cross-border migrations) for about ten years before the AMO, as had Mphasis (the acquired Indian unit). The AMO was created to institutionalize, formalize, and speed up the offshoring process. The official assessment team (AMO plus the business unit) was also involved in deciding where tasks would be located offshore.

5.1 Global triage: an assessment methodology

EDS has developed an assessment methodology for evaluating every task and sub-task in a proposed engagement in terms of its *offshorability*. In summarizing our data we have labeled this process point the *global triage*, analogous to the hospital decision point that determines which patient is in need of most urgent or more specialized treatment.

Each task is rated as easy to offshore (green), very difficult to impossible (red), or somewhere in between (yellow). Such analysis and coding lets EDS systematically select the greens and ignore the reds for offshoring, while focusing on what specific factors make some tasks yellow and examining how they can be converted to green.

The key information for the assessment is illustrated in a diagram adopted from EDS which appears in Figure 1. The diagram illustrates a decision workflow dealing with a proposed contract within Application Services that might involve: software development, modernization, SOA conversion, or enhancement. For each application being considered, key inputs are collected and analyzed resulting in a set of assessment outputs at the bottom of the figure. We learned that many cases do not require every one of the key inputs, but the offshoring plan would usually deal with all the elements in the bottom of the figure.

Nation	Locations and comments
India	Three locations. Most Best Shore activity takes place in India
China	Wuhan and Shanghai
Argentina	Cordoba
Egypt	Smallest of the locations

Table II.
Large EDS Best Shore locations of offshore delivery called “Global Services Centers”

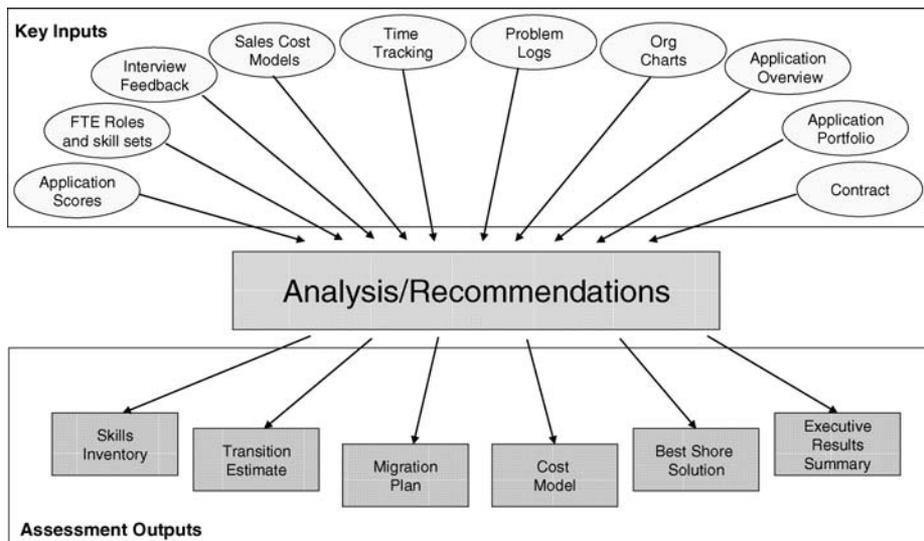


Figure 1.
Factors in the “global triage” offshore assessment process (EDS graphic)

The individual steps that need to be followed in the assessment are listed below. Notice that after the 28 steps, the decision has been made and the migration process begins to the new offshore location.

- (1) Client agreement
- (2) Assessment process orientation with sponsor
- (3) Preliminary in-scope applications agreement
- (4) Complete assessment cost estimate
- (5) Establish assessment team and resource needs
- (6) Joint kick-off meeting eds and client planning
- (7) Finalize application groupings
- (8) Application owner(s) interaction planning
- (9) Assessment orientation with application owners
- (10) Finalize data collection approach
- (11) Assessment questionnaire release
- (12) Finalize assessment interview schedule
- (13) Checkpoint review execution
- (14) Complete applications data collection
- (15) Interviews with application owners
- (16) Analyze various HQ-LC solutions
- (17) Complete transition model (FTE-Walk)
- (18) Finalize “bubble cost” estimates
- (19) Finalize resource skill requirements

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- (20) Complete solution findings summary closedown
 - (21) Conduct internal value reviews closedown
 - (22) Finalize analysis for client value
 - (23) Present findings to client sponsor
 - (24) Articulate delivery transition strategy
 - (25) Communicate risk (if applicable)
 - (26) Communicate viability rankings
 - (27) Communicate governance structure
 - (28) Complete turnover to migration team

Note: Bubble costs are incurred during the transition when duplicative teams are functioning in both locations.

5.2 Critical factors in offshore assessment

Best Shore was used at EDS for additional implementation resources rather than to take over or manage a project. As we noted before, the EDS assessment team looks at all work (including sub-tasks) that needs to be performed for the client in question. The team categorizes each according to ease of migration to Best Shore (offshore) using the traffic-light code, or as one of the interviewees said colloquially – “from ‘low hanging fruit’ through ‘maybe never.’” In order to classify the tasks, the assessment team gathers information using questionnaires and interviews.

Five factors were described by our interviewees as most important in assessing the ease of task migration in the methodology:

- (1) *Complexity*: For example, “How many interfaces does the application have? [. . .and] does it have critical interfaces that require highest reliability? [for example. . .] a bank may need a direct feed to Reuters, and can’t have a 3-second delay if it’s doing currency trading.”
- (2) *Code structure*: “Spaghetti code [unstructured code] is hard to offshore, as people offshore are often ‘freshers’ [new grads] who can’t handle unstructured code.”
- (3) *Current failure rate*: This describes system failures, down time, etc.
- (4) *Skill level of current support personnel*: This refers to people currently supporting the application, either at EDS or at the client. For example, “. . .if a system involves multiple programming languages, there may be 10 people supporting it now, who all know all those languages. . .” But, the offshore location might not have people with these varied skills, so EDS would have to hire more people to get the equivalent coverage, and might not be able to find them.
- (5) *Amount of client interaction*: This was explained in the customary way: if more client interaction is required, then the task is harder to offshore. However, this was followed with the caveat that, over time, the offshore cost savings might overcome the value of hand-holding the client.

5.3 Location decision

As Figure 1 and the list of steps in the offshore assessment process indicate, there are many criteria that are assessed in the location decision. In addition to cost, five factors were identified by our interviewees as being dominant in choosing one location over another:

- (1) *Time zone requirements*: The client may not want work done in distant time zones (e.g. USA to India).
- (2) *Hours of support involved*: If the client wants support in the USA during regular US working hours, EDS would have “to use a third shift in India or China” which was expected to increase attrition. In other words, in tight labor markets like those that existed in 2007, this would increase risks for EDS because “EDS employees would be more likely to leave the company” if they were required to work the night shift.
- (3) *Availability of English-speaking resources*: For example, some clients want “100 percent English-speaking teams.” Our interviewees gave us examples of large EDS locations where English skills are generally weak, such as China and Argentina. If the client is willing to accept 30 percent English-speaking in such countries, with others able to only read/write, then China or Argentina are possible locations.
- (4) *Availability of resources*: EDS likes to start an engagement immediately when the deal is signed, but the company might not have personnel immediately available to ramp up at every site, or as one interviewee described it, using a sports metaphor: “we don’t have a bench.” In this case, EDS would have to wait until people come off another project. However such ramp-up is usually faster offshore because it is cheaper to have people under-utilized.
- (5) *Business expertise*: We learned from our interviews that while it was once common that the location decision was driven by technical capabilities (such as availability of Java programmers), now “business drivers” are more important. Accordingly, EDS was organizing more by industry, trying to develop industry expertise, and business function knowledge in one place. An example that was told to us:

[we] might put all [Name of] Airlines work in one place and develop knowledge of the client and the industry. If [we then] get a contract with another airline, we can leverage some of this knowledge.

5.4 Offshoring decision – who is most influential?

We asked our respondents about which of the stakeholders most influenced the offshoring decision: Was it the client demanding offshoring – typically in order to reduce costs? Or, was it the business units pushing offshoring because it might be more profitable for EDS as the provider? Or, was it the AMO, which was specifically set up to institutionalize an organizational bias towards offshoring? In this context, it is worth noting that salespeople on commission were also involved in proposals for contracts. As one of the EDS respondents said:

Yes, we have a sales organization that is knocking on doors. You can save money! [we tell them]. On existing accounts Best Shore is always on the table; [it is] always in play.

While others are involved, our respondents told us that the client has the final say, and that the client often requests “an offshore component” as part of a bid. In fact, we were told that some clients explicitly request offshoring in their RFP. The preference appears to vary by vertical industry:

[There is] less demand in health care and government. But in most others, there is demand [for offshore].

The creation of AMO, and its global triage process, clearly indicates that EDS was trying to have the work done offshore as well. This did not necessarily translate into higher margins for EDS, as clients expect cost savings to be passed on, but EDS expected that some of the savings could be used for additional IT projects that would go to EDS.

5.5 After the offshoring decision is made: supporting the migration

Once the decision is made, the next phase is a transition phase which is usually labeled “migration.” Generally, migration takes five to seven months. Migration is a high-level category consisting of many activities and sub-phases. We learned from our interviews with EDS managers that AMO involvement is usually about three months broken down as follows: knowledge transfer takes about 1 month; then 2 months for parallel operations. At the end of that point the system/project enters steady state. At that point the AMO disengages and leaves the rest of the migration alignment to the various EDS line units.

AMO has developed standard approaches for migration of tasks offshore. There are two foundation elements to the knowledge transfer. First, work has to be broken down and modularized to be able to be shifted to the low-cost centers. Second is the use of consistent methodology and documentation processes. As part of the knowledge transfer, the offshore team has to document everything it is receiving. At the end of the process, the Best Shore team (the receiver of knowledge) is required to give a presentation to the onshore team (the knowledge source) showing everything learned to ensure/demonstrate that the knowledge has been transferred and understood. Additionally, part of the process revolves around “assets”, such as system documentation and interface diagrams. EDS has experts dedicated to look at existing applications and generate necessary documentation, such as source code. The migration unit works with these experts to generate knowledge transfer documentation.

6. Analysis

Our data show that the innovation called “offshoring” was assimilated at the giant American firm EDS. More specifically, offshoring has now reached the final stage of the diffusion process – it is routinized. We will also make some observations about the speed of the diffusion of this innovation.

Below we restate the key constructs for the three final stages of DOI, and then examine the evidence regarding each stage:

- (1) Stage (3). *Redefining/restructuring*: Organizational structures are altered to adapt to the innovation; these entities act as innovation champions to drive assimilation.
- (2) Stage (4). *Clarifying*: The innovation’s meaning becomes clearer to members of the organization.

- (3) Stage (5). *Routinization*: The innovation has become incorporated into regular activities, processes, and behavior – and the innovation loses its separate identity.

Our data are quite clear that EDS meets the definition for Stages (3) and (4). Regarding Stage (3), the case shows that a new organizational structure – the AMO – was created specifically to promote consideration of offshoring in every proposed contract by the ASD. The AMO in turn developed an assessment methodology to determine whether, where, and how offshoring might be used for each contract. And new offshoring assessment teams, comprising the AMO and business unit staff, were formed to apply the methodology to specific contracts along with the clients. Finally, the AMO was the champion for offshoring. Not only did it lead the assessment teams, but it educated both old and new sales employees and actively promoted offshoring to the business units and clients.

Regarding Stage (4), while we do not have perceptual data about the innovation's meaning to EDS employees, we know that the methodology was applied successfully to 34 proposed contracts. Moreover, it was company policy that the methodology would be applied globally to all contracts but the smallest ones. In addition, the sheer magnitude of EDS involvement in India – which reached 15 percent of employees by the time of the case – means that the “old-time employees” were all well aware of the contours of the innovation and many were exposed to it or were using it.

We also argue that there is evidence that the criteria for Stage (5) are also met. The organizational units – the AMO and joint assessment teams – and the assessment methodology became a routine part of almost every contract proposal to clients. Moreover, AMO is a staff unit aimed at routinizing the offshoring decision process in ASD all across the vertical industries and across EDS all over the globe. Thus, it is clear that the innovation has been incorporated into regular activities, processes, and behavior at this company. In fact, we were told by one of our interviewees that the careful, rigorous process of task allocation was so impressive that it was being used by units even when offshoring is not considered in any way. In other words, we have strong evidence in this case that the innovation has reached Stage (5).

In addition, recent follow-up interviews after the acquisition of EDS by HP indicate that AMO and its decision process have been adopted by HP and are continuing to be promoted within the HP-EDS-Mphasis organizations. This is further evidence of the routinization and sustainability of the innovation.

In terms of the diffusion of a managerial innovation, what AMO is doing is similar to what a Six Sigma or a TQM organization would do one decade ago. By requiring that most project bids go through the AMO, EDS increases the likelihood that work will be allocated offshore because the decision is funneled through an organizational unit that has deep knowledge of offshore resources and a systematic process for assessing their fit with proposed contracts. In fact, it is quite likely that managers at the unit are personally invested in seeing more work go offshore because of the nature of their jobs.

There is one dimension of routinization that is ambiguous and that is the Rogers' statement that “the innovation loses its separate identity” (Rogers, 2003, p. 180). It is not clear to us that this is a correct criterion for assessing routinization of offshoring as an innovation. If we look to global businesses, the location decision for new plants (or for a new regional office) is always a politically contentious one and one that is quite visible (Davidson, 1993). The argument over whether work should be done in the USA

or in India, for example, will not go away. Does this mean that offshoring has not been routinized? We posit that it does not.

Having argued that the innovation has been routinized, reaching Stage (5), we consider the time that was required for routinization of this innovation and the speed with which it was diffused. While we did not study longitudinally, we can make estimates based on publicly available knowledge since EDS is such a large and visible company.

Large American ITPS firms began to provide some offshore services as of roughly 1997-2000 (Carmel and Tjia, 2005). These were the early initiation stages of DOI discussed above in the literature review. By 2007 EDS had already reached “routinization” which was the final stage of implementation in DOI (Rogers, 2003). Therefore, we contend that the innovation that we call offshoring, diffused within 7-10 years. We assess that for a managerial innovation this is a fairly rapid diffusion. By comparison, Fichman and Kemerer (1999), who studied diffusion of an IT artifact, the adoption of relational database management systems, saw broad diffusion (deployment) in similar time frames of 5-10 years. On the other hand, Redwine and Riddle (1985) found that major software technologies took much longer to be widely adopted, in which case EDS’s adoption looks relatively fast.

It may be that EDS was faster to routinize offshoring than the average firm, possibly due to the intensity of competition in the IT professional services industry. Interviewees emphasized the importance of cost reduction as driving the rapid growth in offshoring. This pressure comes not only from EDS management, but from clients who ask specifically about potential cost savings from having work done offshore.

Also, this might be a case of a managerial fashion (Abrahamson, 1991), or evidence of social contagion (Teo *et al.*, 2003) at work, with EDS responding to social pressure to adopt as a result of the adoption decisions of others in its immediate peer group. In fact, as we have noted, EDS was initially slower to offshore than some competitors. Its concentrated efforts to develop new institutional forms and new processes, and to promote offshoring proactively throughout the organization might have been driven by such external pressure. Or it could be that offshoring, as a managerial innovation, was relatively easier to institutionalize than technology-based innovations (Birkinshaw *et al.*, 2008)[1].

7. Implications for theory and practice

7.1 Theory

We have documented the rapid diffusion of an important innovation in the 21st century – offshoring. We have also filled a gap in studying managerial/administrative/process forms of innovation. These types of innovation have not been widely studied in the information systems discipline in comparison to technological innovations. Our research also is distinguished by the fact that it examines the late stages of an IS innovation, while most studies look at earlier stages. But, perhaps most important, we have come across no research that applies DOI to offshoring and consequently, it is the first such study to the best of our knowledge.

We contribute to theory also by applying the hypothesized stages of innovation diffusion in an organization to the context of offshore software services. The use of an in-depth case study allows us to examine in detail the broad concepts of restructuring, clarifying, and routinizing innovations and how these concepts can be used to explain both the nature and speed of the diffusion of a managerial innovation.

We also made some estimates of the speed of diffusion of this innovation which will be useful to subsequent studies that examine the velocity of diffusion in other process innovations.

7.2 Practice

Did the innovation afford EDS a competitive advantage, or was it pushed by the USA and foreign competitors? Our data suggest that the larger business environment is what drove EDS to diffuse the offshoring innovation so rapidly. The rise of ITPS firms in India (e.g. Infosys) was a catalyst for rapid diffusion of offshoring within EDS, as was the offshoring by competitors like IBM, Accenture, and CSC. However, the innovation by itself was not enough to provide a competitive advantage. EDS, as an American-based firm, could not reduce its costs down to the level of the Indian firms.

The EDS organization that we describe was driven to routinize this innovation as a competitive necessity, rather than one that truly moves the company ahead of its rivals. Offshoring by itself was not a source of EDS differentiation, but at least gave the company a basis to stay cost competitive so that it could take advantage of other types of differentiation, such as industry knowledge and existing customer relationships.

Some of the organizational structures supporting offshoring were not derived from EDS or from other American firms. The Indian firms were the first to introduce the three-tier structure that is separated into on-site, onshore, and offshore. The three-tier structure emerged with the Indian firms in the late 1990s and has enabled and facilitated the offshoring of IT work (Carmel and Agarwal, 2001).

While offshoring has been used by EDS and others mainly to reduce costs, EDS increasingly is interested in the skills and capabilities that its Best Shore locations offer. Highly skilled talent can be a source of competitive advantage if it is recognized and deployed. EDS considers its deep knowledge of industries such as transportation, communications, finance, and health care to be its key differentiator in the competitive IT services market. As its Best Shore locations gain such knowledge, they can add to EDS's strengths in those areas.

7.3 Summary

Offshoring is still difficult to do successfully and offshoring is a complicated business process in which stakeholders frequently encounter problems such as cultural differences, time zone differences, knowledge transfer, employee retention, and intellectual property protection (Rottman and Lacity, 2008; Kotlarsky *et al.*, 2008). However, we have found that at EDS offshoring is no longer seen as an innovation, but a routine part of doing business, facilitated by a dedicated organization for assessment and migration and standardization of practices for managing the offshore relationship.

Note

1. We thank an anonymous reviewer for pointing out this potential explanation.

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