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Assignment #3.1

Marschall, D. (2002). Internet technologists as an occupational community: Ethnographic evidence. *Information, Communication & Society*, *5*(1), 51-60.

This paper profiles a group of skilled workers, dubbed "Internet technologists," in a small American software development company. The author conducted ethnographic fieldwork (interviews and observation) over a period of thirteen months at the firm "IntenSivity Unlimited." He describes the behavioral norms and values of IntenSivity employees from an integrated perspective, and he outlines the measures taken by IntenSivity management to create a company culture of high involvement and high achievement. His paper presents one model of an occupational community, and may provide an exemplar for future managers and entrepreneurs seeking to instill the same rigorous expectations and cultural homogeneity in their own firms.

Marschall (2002) defines an occupational community as a "bounded work culture" of professionals whose identities are influenced by their occupations, who share a collective understanding of behavioral norms and values, and who maintain close social relationships with one another outside of the workplace (p. 52). At IntenSivity, these characteristics are cultivated through a variety of techniques. Management rewards long work hours with commendation and promotions, which encourages a high achievement norm for workers. They require close collaboration in teams and organize weekend activities to nurture interpersonal relationships. An indoctrinating "Bootcamp" fosters a sense of belonging between new arrivals on a personal level by capitalizing on the shared recreational interests of the predominately male, highly educated workers.

This heavy manipulation of organizational culture by management can also be seen in the case studies of three successful business founders presented by Schein (1991). Two of the founders, Jones and Murphy, infused their burgeoning enterprises with personal beliefs on hierarchical organization and management styles. While these founders were not necessarily unilateral decision-makers—like the "Chump-free" IntenSivity, Murphy distrusted arbitrary authority and favored group consensus (p. 20)—both wielded autocratic power over the cultures of their firms. Jones enforced his ideals by personally monitoring daily business operations and closely supervising his subordinates, and Murphy was highly critical of his employees if they failed to mirror his own work ethic (p. 21). Similarly, the team leaders at IntenSivity evaluate and interact with Internet technologists continuously during the development process. The CEOs disseminate ideals through mottos and anecdotes, and they present themselves as fellow members of the occupational community through personal example.

The third case presented by Schein (1991), in contrast, portrays a business founder with minimal influence on the behaviors and attitudes of his workers. The prevailing norms were instead shaped by employees brought into the organization, as the patient care culture was shaped by the nurses studied by MacIntosh-Murray and Choo (2005). The nurses constitute a "community of practice" (p. 1340), an entity which lacks the socialization process and strong group identification of an occupational community (Cox, 2008). Like Internet technologists, nurses have specialized skills and are socially isolated by heavy workloads and long hours on the job. However, while IntenSivity CEOs are included in the Internet technologists' occupational

community, the hospital administration lies outside the nurses' community of practice. This social distance creates resistance among the nurses against the interference of higher authorities. Unlike the Internet technologists, who willingly integrate the company norms into their personal identities, the nurses require a change agent to do the opposite: adopt administrative requirements to fit their existing routines.

The ideological separation between the nurses in patient care and the hospital administration is similar to the friction between separate functional units in Allen's (2005) ethnographic study of a manufacturing firm. The factory's functional units have fundamentally different work priorities, which raises disagreements regarding the appropriate use of the enterprise resource planning system. Workers distance themselves conceptually from one another, allying themselves along the lines of local practices. While IntenSivity exhibits a high level of cooperation within the firm, the subcultural loyalty in the factory resembles the attitudes expressed by IntenSivity employees towards "non-technical people" and other workers in the profession who do not fit the organization's profile. CEOs take pains to define "an *inside* and an *outside*" (p. 63) between IntenSivity and the rest of the world, and the company screens potential hires for characteristics they consider desirable. This selectivity both creates and preserves the elitist culture of the company.

The occupational community formed by the Internet technologists is somewhat organic, arising in part due to the shared interests, histories, and values held by the workers who enter the company. However, as illustrated by the effects of policies implemented by IntenSivity CEOs, external sources can also encourage the formation of occupational communities. This case shows that a close-knit, homogenized culture can be created if managers require frequent social interaction between employees, are closely involved with and share the same goals as their subordinates, assimilate new inductees, and clearly define and maintain the boundaries of the organization as a social entity.

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Assignment #3.2

Neff, G., Fieore-Silfvast, B., & Dossick, C. S. (2010). A case study of the failure of digital communication to cross knowledge boundaries in virtual construction. Information, Communication & Society, 13(4), 556-573.

This study analyzed the failure of a digital tool, building information modeling (BIM), to support collaboration between the different functional units involved in large building projects. An ethnographic study of the workers in three urban projects was conducted over thirty-two months. Sixty-five architects, engineers and builders, who were unconnected to these projects but had experience with BIM, were also interviewed. The combined results were analyzed to uncover the potential reasons for the failure of BIM. The authors found that the superficial permanence of 3D models rendered in BIM hindered collaboration by reducing the interpretive flexibility necessary for professionals with different priorities to work effectively from a collective project representation. The software highlighted the conflicting goals of individual units within or across companies and fostered a culture of distrust between them. The findings indicate that the design of software for collaboration should be flexible enough to accommodate different subcultures and levels of interpretation.

BIM was intended to be a collaborative tool for workers in the construction industry, acting primarily as a 3D modeling tool, as well as a database for building components and domain-specific information. Conceptually, the interviewees and building project workers believed BIM should smooth communications. They asserted that customary 2D drawings are too ill-defined and cause conflicts among workers with different "visions." The complex calculations necessary to reconcile construction with design led to information overload during tense conversations. Compacting the information into 3D models, they believed, would minimize confusion by establishing a common frame of reference. However, while ambiguity may have been reduced, the goals of each functional division remained distinct. Though the 2D models seemed to create conflict, the "interpretive flexibility" they provided allowed workers to enmesh their disparate visions into the final product throughout the creative process. Instead of fostering collaboration, BIM encouraged each unit to separately address their needs in competing models. For example, builders prioritized aspects of the model useful for estimating costs, engineers prioritized aspects of structure for analysis, and architects the elements of design (p. 566).

The contrast in priorities between the different professions involved mirrors the efforts of lab members in Forsythe's (1993) ethnographic study of AI practitioners to define themselves distinctly in the world of academia. Forsythe found that though the practitioners spent the majority of their time engaged in collaboration, consultation, research, and clerical or administrative tasks, they consistently defined "real work" as the application of a narrow set of technical skills: writing code, building systems, and solving problems (p. 467). Forsythe points out that the majority of their actual activities are identical to those found across disciplines in academia, but the lab members focus exclusively on the tasks that differentiate them when describing their own work (p. 472). Similarly, the builders, architects, and designers may work in comparable environments, work with the same resources, and share the same ultimate goals, but their differences come to the fore during collaboration. BIM allowed the groups to establish

"boundary markers" by choosing certain types of information embedded their models and ignoring others.

Forsythe hypothesized that the AI practitioners' selective understanding of their work could affect the viability of their products in the real world. Poltrock and Grudin (1994) drew similar conclusions from their case studies of two software development firms. They found that the organizational structure of one of the companies hindered the construction of usable software by restricting the interface developers' access to users, requiring them to rely on the information provided by intermediaries. The second company was able to forge stronger relationships with customers and produce more successful products by prioritizing user input and giving the developers full responsibility for product design. While the second company actively sought out user input on the product during development, the first depended on the reports of customer representatives to articulate the users' needs. Forsythe's study showed this approach to be unreliable, as the purpose of the software (and the very nature of "work") as conceptualized by a manager, a marketing director, a programmer, and a final user may be very different. The purpose of BIM models is also understood differently by the builders, engineers, and architects in Neff *et al.* A 3D model built by any one division will likely fail to reflect the needs of the others, leading to conflict and, ultimately, an environment of distrust.

English-Lueck *et al.* (2002) examined the roles of trust and culture in the business relationships of IT professionals in "Silicon places." The authors found that companies in different cultures (American, European, East– or South Asian) had different norms of interaction, but all needed to build trust between workers and with other organizations to conduct business effectively. Some companies deliberately wielded stereotypes of their national cultures to build this trust, "using Irishness or Chineseness to create an image of trustworthiness" (p. 105). Similarly, the different workers involved in Neff *et al.*'s building projects drew boundary lines in identity using generalizations, contrasting what "we" (architects) do with what "the field guys" expect or how "an engineer" thinks (p. 567). Unlike the positive effect of generalizations in English-Lueck, however, this identity construction alienated the disciplines to the point that some interviewees felt the need to "guard" their models from misinterpretation by the outsiders (p. 566). While a Dublin-based company could focus on the intertwined histories of Ireland and America to build relationships with customers, BIM augmented the differences between architects, engineers, and builders rather than their commonalities.

Though BIM was initially perceived to be helpful for collaboration, the software had unintended consequences for the relationship dynamics between the groups involved in building projects. The design of BIM, in combination with the way it was approached by users, created disciplinary "silos" within the industry instead of fostering communication. These failures imply that designers of collaborative software should be sensitive to the different—possibly competing—priorities of different user groups.

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Assignment #3.3

Fitzgerald, G., & Russo, N. L. (2005). The turnaround of the London ambulance service computer-aided despatch system (LASCAD). *European Journal of Information Systems*, *14*, 244-257.

This paper examines the failure and subsequent "turnaround" of the London Ambulance Service (LAS) Computer-Aided Despatch System (CAD). The authors conducted semi-structured interviews over a period of six months with five "key players" in the successful implementation of LASCAD in 1996, two of whom were involved with the first failed attempt in 1992. The authors found that the significant differences between the first and second versions of the system lay in project organization (timetables, project management and training), the information system itself (complexity, user-friendliness), supporters (trust in management, morale, biases), and the organizational environment (labor relations, strategic vision, and politics). They assert that the 1992 attempt failed because of an unrealistic timeline and poor management, overly complex and untested software, and lack of support from staff due to a hostile external environment and poor communication. The 1996 "turnaround", on the other hand, was conducted at a slower pace with more management resources, integrated existing workflows into the software design, and elicited buy-in from stake-holders early on. These elements have implications for the design and implementation of electronic systems within organizations in general, and within large, politicized organizations in particular.

According to Fitzgerald and Russo, the first factor in the failure of the 1992 attempt to implement LASCAD was in project organization, originating from the inexperience and poor decisions of management (p. 249). The developers and management had no prior experience building systems of this kind, chose speed at the expense of quality, and took an authoritarian approach to development which ultimately led to an unsatisfactory product. A survey by Armstrong and Sambamurthy (1999) of 235 senior executives in top management teams (TMTs) found that CIOs' IT and business knowledge, as assessed by superiors and other TMT members, predicted the success of IT assimilation at their firms (p. 317). The authors suggest that this knowledge allows leaders to identify the firm's needs and apply appropriate IT solutions (p. 318). Similarly, the new LAS management was successful in the second implementation of CAD partly because they hired developers with direct knowledge of and experience in command and control systems (p. 249). The assertions by Armstrong and Sambamurthy suggest that these developers were better able to identify the needs of ambulance workers and design a usable system than the previous external vendor.

Another finding of Armstrong and Sambamurthy was that the sophistication of IT infrastructure—the "extent to which a firm has diffused key information technologies into its base foundation" (p. 309)—also correlated to the success of IT assimilation. Before 1992, a prior attempt to computerize LAS procedures had failed, so there was no electronic system in place (p. 249). Therefore, ambulance workers experienced frustration from the sudden implementation of a complex interface. Their frustration was amplified because the new system had little in common with existing manual workflows. Saleem *et al.* (2009) illustrated the tenacity of habit in a study of employees at a large Veterans Affairs Medical Center. Informants chose to employ paper-based workarounds instead of the electronic health records (EHR) system for a variety of reasons, many of which were not necessarily rational. For example, using pre-printed forms

provided the illusion of efficiency, and doctors preferred having something tangible to "walk into the patient's room with" (p. 621). Most importantly, medical center staff members were not familiar with the EHR program, and considered pen and paper simply easier to use. In the 1996 turnaround of the LASCAD, developers made the deliberate decision to map existing practices onto the design of the software. This minimized the effort required of staff to adopt the new system and inhibited fear and resistance towards the initiative.

This resistance was another key component of the 1992 failure. At the time, LAS management did not earn the support of the organization for CAD and created an atmosphere of mistrust (p. 251). Environmental factors outside of management's control also strengthened resistance; a politically charged battle between the National Health Service and labor unions inclined staff to oppose the system unilaterally and the government to pressure leaders to "push through automation as quickly as possible" (p. 251). In the second attempt, management resisted political pressures and secured the "buy-in" of staff by cultivating a positive working environment, negotiating with union leaders, and pursuing the project in-house. A study of the successful implementation of EHR in a small medical clinic conducted by Carayon *et al.* (2009) also showed that early buy-in by personnel can smooth the transition to a new information system. Like the 1996 version of LASCAD, the work was performed by an in-house team of clinical staff (p. 10). Top management enforced the sufficient training of users, and staff members believed they had moderate influence on the design and implementation of the system (p. 15). This may have been partially responsible for the ultimately positive evaluation of the system by clinical staff, despite the technical issues and increased workload associated with the new system.

The failure and subsequent success of the LAS in developing and adopting the Computer-Aided Despatch system provides an exemplar for firms considering a switch to any new information system. The highly publicized failures of the initial attempt highlight the importance of allowing sufficient time for development and training, including stake-holders' input and existing workflows in product design, and maintaining healthy relationships between upper-level management and the end users. The inability of the initial system to handle the incoming load of information in a real-world setting emphasizes the necessity of sufficient testing and a solid understanding of user needs. Finally, the case as a whole demonstrates the influence of competent leadership on IT implementation. Managers undertaking projects on the scale of the LASCAD should be cool-headed, well-informed, and capable of employing the resources and social skills necessary to ensure success.

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