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EMPLOYEE RIGHTS AND PARTICIPATION IN THE DESIGN OF INFORMATION SYSTEMS IN THE EUROPEAN UNION AND THE UNITED STATES: CODETERMINATION LAWS AND VOLUNTARY PARTICIPATION

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ABSTRACT

Business organizations have exploited the innovations enabled by information and communications technologies to modify their modes of operation in order to improve their effectiveness and strategic positioning. However, this continuous stream of new technologies and their applications have affected (sometimes negatively) the work life of employees, who must make the adjustments necessary to accommodate technology-induced changes. Old fears about the potentially adverse impact of the proliferation of applications of information technology (IT) linger while newer concerns have emerged. In this article we undertake a critical analysis based on our legal and IT perspectives and a thorough review of the relevant literature to examine this "creative destruction." We examine different motivations for including employees in the design of information systems and how such inclusion may help to co-generate features that are both important for business success and responsive to the human impacts of employee/IT interaction. Except in European Union (EU) countries that endorse codetermination, there is very little legislation elsewhere that addresses individual participation in information systems design decisions as an employment right. This EU experience is compared with other voluntary approaches.

Science and technology have spawned many notable innovations during the last 100 years in world history. These include advancements in nuclear science with its considerable positive and negative effects; major accomplishments in transportation and aerospace technology, including manned voyages to the moon; significant advancements in the medical sciences resulting in an almost 150 percent increase in life expectancy, progress with the human genome project, and the capability to clone humans. Many of these and other developments have instigated appreciable changes in individual and organizational activities. However, the strides made in information and telecommunication technologies, which produced the Internet and the World Wide Web, have arguably affected organizational structures and work practices more extensively than any of the other innovations. Yet employees have not always been involved in the adoption and implementation of information technology (IT) applications.

The influx of computers in the workplace and the increasing dependence on IT in all areas of organizational life have significantly altered the dynamics of the work environment and continue to promise innovations that were once barely imaginable. However, the study and discussion of this phenomenon have been dominated by considerations of the technology itself and its impact and implications for corporate positioning and results [1, 2]. The social, psychological, and other negative effects on the lives of individual employees are rarely, if ever, evaluated [3]; greater attention is paid to the rules and objectives of the game than to the experiences of the players [4]. Consequently, there seems to be only a distant connection between the interaction of technology and an employee's workspace, individual employment rights, and employee participation in technology decisions [5, 6].

In the United States, a right is recognized as a legally enforceable entitlement or privilege to which one has a natural claim. Individual employment rights therefore derive largely from federal and state employment laws, collective bargaining agreements (unionized contracts) and individually negotiated agreements [7]. However, this definition has been extended to include moral claims that an employee can reasonably demand [8]. While these claims may not be legally safeguarded, they reflect the ethical principle that employees are persons first and foremost and should be respected and not treated as mere means to satisfy the profitability objectives of organizations [8].

Existing U.S. legislation enacted to clarify and protect individual employment rights was designed for organizational interactions that preceded the proliferation of IT applications in organizations. As such, those laws seem to provide less than adequate protection, especially against unscrupulous management and subtler forms of abuses [9]. The paucity of laws that specifically target IT-related infringements of employee rights is, therefore, not surprising because such occurrences are nebulous and more difficult to define and identify. The few IT-related laws that exist target behaviors that are perpetrated by employees on each other; for example, using electronic means to libel or defame others,

transmitting messages that incite hate or discontent, providing or downloading sexually explicit material, transmitting repeated unwanted sexual advances, or falsifying information through impersonation [10]. Employee involvement in the design of information systems that alter the work practices they engage in is not considered a right.

Employees encounter information technology mostly through the myriad of information system (IS) their organizations engage to automate business processes (or work systems). Organizations make IS investment decisions, but it is employees who use these systems. The benefits of such investments can only accrue from effective use [11]. This phenomenon has given rise to a large area of research called technology adoption and innovation diffusion. these studies have attributed employee acceptance and use of IS to several factors, including the extent to which their legitimate inputs and preferences are incorporated into the set of requirements to be satisfied and the extent of their direct participation in the design of these systems [12]. Employee participation in IS design is believed to enhance system quality, stimulate employee (user) acceptance, and reduce rejection during implementation. In many European Union (EU) member states such participation is legally mandated by their codetermination laws [13].

In the rest of this article we discuss the state of legislative activity that bears on information technology and individual employment rights. Then we explore the proliferation of IS in organizations and its potentially adverse impact on employees, and posit that this situation can be remedied by collaboration among managers, information technology professionals, and other employees through the application of user-centered design principles and attention to human-computer interaction (HCI) concepts in IS design. We then describe three major design philosophies and several other micro techniques and tools for effecting employee participation in IS design. The three design philosophies are: 1) participatory design; 2) effective technical and human implementation of computer systems (ETHICS) used by some EU countries; and 3) joint application design (JAD). Participatory design is enforced by legislation; the others are not.

ORGANIZATIONS, IT, AND EMPLOYEE RIGHTS: LEGISLATION

The American Civil Liberties Union receives more complaints concerning infringements of individual employment rights such as intimidation, coercion, reprisal, and discrimination than about government's misuse of power against citizens [9]. This is because U.S. private sector employment contracts default to the employment-at-will doctrine, which has only limited safeguards against arbitrary behavior and wrongful dismissal [7]. However, some employees negotiate individual contracts; unionized employees are covered by the negotiated terms of collective bargaining agreements; and several federal and state laws have established employment rights. Many of the existing laws have evolved over

time, but the proliferation of IT, while producing organizational benefits, has introduced its own set of issues and in some cases exacerbated the problems for which protection was originally provided. Table 1 highlights this dichotomy, and some of the potentially adverse side effects are elaborated in the ensuing discussion. It has long been conceded in the U.S. that workplace/workflow automation is nonnegotiable in contract discussions [14]; however, we believe that employee participation in the design of these systems should be guaranteed.

The increased reflection on employee privacy rights is one of the IT-related issues. This is because of the large amount of data employers collect, abetted by the greater efficiency, data manipulation, and transmission capability of modern IT. It is recognized that agreements about the boundaries of collection and use of these data are necessary to provide the perception of fair information practice, reduce intrusiveness, and honor expectations of confidentiality [15]. While the Electronic Communications Privacy Act of 1986 (ECPA) offers workers some protection in communications privacy, it facilitates employee surveillance. Employers are permitted to monitor networks for business purposes [16], and the rules governing such scrutiny require only company notification that employees may be monitored.

The potential of information technology to generate far-reaching innovations with the possibility of significant economic returns has raised the stakes in two other areas: ownership of inventions at the workplace and noncompete agreements. Legislative activity may be required to prescribe acceptable terms of reference for both employers and knowledge workers to reduce contentious litigation. With the former, employers typically assign to themselves on-the-job inventions of employees and, through the latter, restrict the types of employment a former employee may accept. These agreements are usually nonnegotiable preconditions of employment, but they are not always legally enforceable [17]. In cases to date, employers seem to bear the greater burden of proof where a

Table 1. Balancing Technology's Impact

Organizational benefits	Negative employee impacts
• Efficiency	• Fear of job loss
• Effectiveness	• Technology anxiety
• Increased business value	• Postimplementation depression
• Integration and coordination	• Fear of surveillance
• Customer service	• Loss of ownership of creative products
• Strategic enablement	• Perception of health hazards
	• Poor knowledge sharing

person's employability is at stake, and some states have imposed limits on the curtailment of the right of employees to transfer their knowledge and skills to new employers [18].

The Workers' Compensation Law (1948), which was enacted to guarantee the payment of medical and wage loss benefits to employees physically injured at work, is yet another example of a law that may need an overhaul to accommodate IT-induced maladies. One in four companies experiences performance dips after the deployment of enterprise resource planning (ERP) systems (large systems that integrate multiple business processes across several functional areas of an organization). This condition is attributable to postimplementation depression, sometimes referred to as ERP hangover, which results from panic due to the major dislocation these systems cause and the feeling of frustration employees experience in unfamiliar work situations [19]. There is no provision in the Workers' Compensation Law, however, for stress-related illnesses or psychological problems, which are likely to be treated with less sympathy than physical ones.

Another similar phenomenon involves the awareness that some employees suffer from technology anxiety. This is severe apprehension about current or imminent information technology use [20, 21] triggered by the fear of the embarrassment of being thought computer-incompetent and manifested in symptoms that range from severe and noticeable agitation to milder unexhibited discomfort [20]. Technology anxiety may be a personality trait or it may be induced [21]. A plausible case may be made for including such a condition under the provisions of the Americans with Disabilities Act (ADA) which mandates employers to make reasonable accommodation for people with disabilities to perform job functions and enjoy accustomed employment benefits and privileges [22].

The Age Discrimination in Employment Act (ADEA) and the Occupational Safety and Health Administration (OSHA) regulations may also need new clauses to accommodate subtle IT effects. In the case of the former, it is believed that younger individuals are more capable of assimilating the constant wave of IT innovations [23]. Such a thought process would constitute a breach of individual employment rights if it resulted in supportive employment action. OSHA, which regulates general safety and health standards in the workplace, has no specific standard that applies to hazards related to IT products and applications. Although the evidence is inconclusive, the emissions of extreme low-frequency fields or higher frequency radiation fields have been thought to threaten the health of pregnant women. However, while OSHA regulations apply generally to overexposure to radiation, noise, and electrical hazards, they do not specifically address computers [24].

In some cases IT-enabled innovations have added new concerns. Yet there is no indication of any imminent legislative activity or noticeable agitation. For example, organizations are now promoting knowledge management projects to leverage their intellectual capital. They view the amalgam of employee knowledge as a key organizational resource to be managed like other assets, and embrace the

theory that harnessing this knowledge and providing barriers to its transfer and replication has potential strategic importance. But this could be to the disadvantage of employees, who must contribute their own knowledge without new compensation schemes or additional incentives [6].

Some emerging technologies pose other threats to individual employment rights. Digitization allows biometric devices to verify employee identity by capturing some physiological or behavioral characteristics, translating into a string of numbers that are then stored in a database and later matched them to "live" biometrics presented as proof of identity [25]. Second-generation techniques such as hand geometry identification, facial recognition, iris identification, retinal scanning, and vein recognition have become increasingly prevalent. Newer, and perhaps more intrusive techniques include gait recognition, which uses the unique cycle and cadence patterns in employees' steps to identify them from a video sequence of steps, and body odor recognition that captures volatiles (the chemicals that make up human smell) from the back of the hand to develop and store a personal "odorgram" [26].

ORGANIZATIONS, IT, AND EMPLOYEE RIGHTS: COLLABORATION

There is not much expectation in the United States that new legislation will address potential threats to individual employment rights due to employee/information technology interaction except, perhaps, for sporadic responses to egregious incidents like those that motivated the Sarbanes-Oxley Act. However, these interactions will increase as information systems become more sophisticated, more ubiquitous (covering a wider spectrum of business operations) and more integrated (exploiting the cross-functional nature of some work systems). We present a case for greater collaboration that will be more inclusive of employees in information systems design decisions by describing a normative model of such interaction and discussing the benefits of employee participation in systems development as well as pitfalls of managerial and technocratic domination of the process. This approach embraces the parallel design of technical and social requirements and human-computer interaction concepts.

Figure 1 provides a prescriptive overview of how this interaction should occur in order to maximize user-developer collaboration in systems delivery. It denotes that an enterprise delivers the information systems it needs within the context of its prevailing organizational characteristics (the business processes it employs, existing structure and culture, the information technology infrastructure it has acquired). The organization plans information systems delivery projects, sources them through self-development (insourcing), purchase, or contract development (outsourcing), and then deploys them (i.e., puts them into use). Despite conflicting results, a preponderance of the evidence indicates that user association with information systems development contributes to higher quality systems and leads

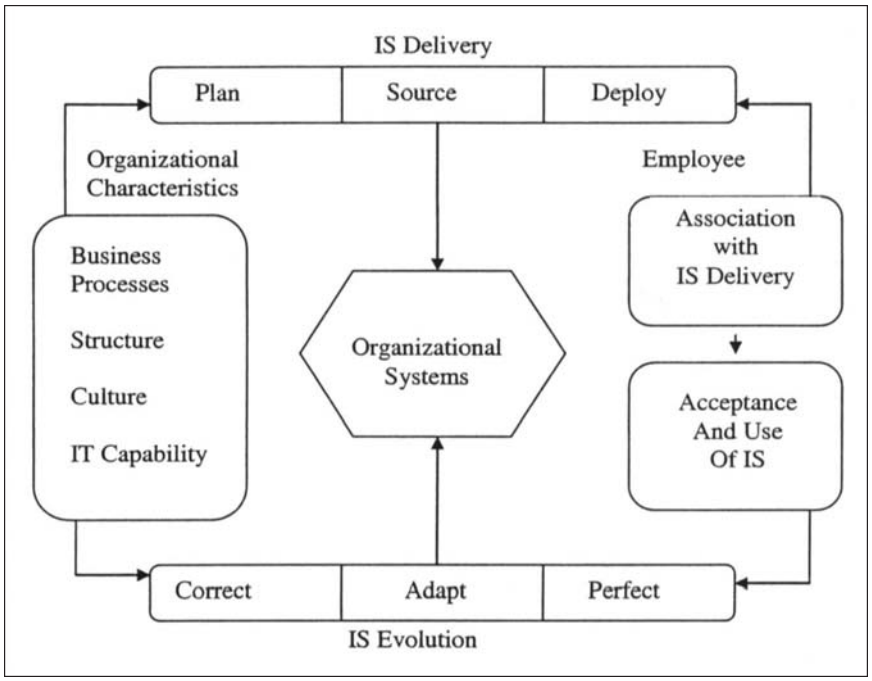

Figure 1. IS delivery and evolution.

eventually to system acceptance and use [27]. Information systems evolve (as a result of use) as employees identify errors to be corrected, assist systems developers adapt the system to business processes changes, and request new functionality over the useful life of the system.

Normally, organizations make decisions about information systems investments that are justified by the technical and economic benefits they promise [28] (e.g., impact on productivity, improved information flows, increased profitability and competitiveness, better customer service); however, these are second-order effects. First-order effects derive from appropriate and successful use by employees [29]; several technically sound and successfully deployed systems have never been used [30]. Research findings and leading IS delivery practices strongly indicate that effective employee involvement is a prerequisite for eventual system use [27].

Information systems also impose changes on organizations and their employees, who often have adverse reactions to these changes [31]. While employees' acceptance and use of information systems are not voluntary, their reactions to adverse changes have led to subtle rejection and passive resistance [32, 33], through avoidance, circumvention, or sabotage [34]. In general, information

systems have been viewed largely as technical artifacts, with developers and managers displaying only peripheral interest in the social systems into which these technical artifacts are embedded and with which they interact [30]. The repeated failure of information systems generated by such an approach, however, has stimulated interest in user-centered and participative methods, which pay equal attention to both human and technical dimensions of systems design and leading human-computer interaction practices [35].

Parallel Design of Social and Technical Requirements

Conventional systems delivery methods concentrate on identifying the functionality (features and properties) that IS should produce and the technical infrastructure that enables them, often without reference to the human interactions that affect and are affected by IS implementation [36, 37]; employees are expected to adjust to technical artifacts. However, IS delivery and use involve a combination of social and technical processes that are immersed in complex organizational structures [12]. This inadequate attention to the social structures and contexts during the design of IS has triggered user rejection of even otherwise technically sound applications [30]. Collaborative design approaches therefore seek to readjust the balance in the focus on human, organizational, and technical elements of the implementation environment [35, 38], promote the co-generation of social and technical requirements [39, 40], discover hidden practices and undocumented effects, and identify ethical issues that could present obstacles to IS delivery and use [41].

Human-Computer Interaction Concepts

Human-computer interaction is an emerging subdiscipline that focuses on employee issues with systems delivery and use. It is concerned with characteristics of the joint performance of tasks by humans and machines and the structure of communication between them [42]. Human-computer interaction is multidisciplinary; its concepts are drawn from several areas such as computer graphics, operating systems, human factors, ergonomics, communication theory, cognitive psychology, and the social sciences. It is sometimes called human engineering or human factors engineering [43]. Human-computer interaction includes human-centered design, the evaluation and implementation of interactive computing systems for human (individual and group) use, and the study of human issues associated with delivering usable systems such as motor skills, memory, perception, motivation, and semantics in a variety of application domains [44]. Its ultimate objective is to optimize fit between the technical artifact, its use, and users, to produce better systems for humans.

EMPLOYEE ASSOCIATION WITH INFORMATION SYSTEMS DEVELOPMENT

Legislation similar to the codetermination laws that some EU countries have enacted to mandate the participation of employees in information systems decision making [13] is not forthcoming in the United States. Yet user-centered design approaches have evolved from the pragmatic business need to improve information systems quality and produce usable systems that provide acceptable returns on IT investments. Most of the guidelines for stimulating effective systems delivery and use have recommended these user-centered and human-computer interaction concepts, which we discuss along with approaches that apply these principles. The more elaborate (and also more widely adopted) are design philosophies such as participatory design, and effective technical and human implementation of computer systems (ETHICS), which are applied by EU countries, and joint application development (JAD), which is used mostly in the United States. However, several less prevalent microtechniques and tools like storyboarding, playscripts, the on-site customer, FOLKLORE, prototyping, and focus groups have assisted in securing employee participation in information systems development.

Effective user association with systems development has been recognized as a prerequisite for system success [27]. According to the theory, users involved in systems building usually endorse system goals, and this increases their perception of the usefulness of the system. Such positive identification in turn produces a high level of commitment to system outcomes [45]. However, empirical research results have not consistently confirmed this positive correlation [46]. These inconclusive findings have been attributed to inadequate definition and the identical operationalization of several related but distinguishable user-association constructs that indicate different degrees of association [27] and in turn produce varying degrees of information systems effectiveness.

The following four progressive gradations of employee association with information systems have been identified in order of effectiveness, with succeeding stages incorporating the attributes of earlier stages and producing a higher level of commitment; however, these levels have not been distinguished in user-association studies:

- User participation, the intellectual occupation with the accomplishment of assigned tasks [27].
- User involvement, the psychological state that attaches significance to the affiliation with an information systems delivery project [27].
- User ownership, which goes beyond involvement and motivates pride of possession and a sense of responsibility for the success of the system [47].
- User championship, which occurs when user-owners become system "missionaries" who promote the system and encourage others to use it [47].

User-Centered Design Philosophies

All three user-centered design philosophies (participatory design, ETHICS, and JAD) have similar objectives but they differ in motivation and application details. Participatory design stresses technical knowledge-sharing to enhance social interactions [36] and ETHICS, with roots in organizational behavior, addresses work meaningfulness and employee self-realization [48]. JAD attempts to exploit opportunities for user-developer teams to experience information-sharing synergies during systems analysis and design [49]. All three are facilitated techniques; however, ETHICS is a formal methodology with prescriptions for how to satisfy its objectives, while participatory design and JAD are less structured and possibly more dependent on facilitation effectiveness.

Participatory design originated in the Scandinavian countries as a means of incorporating worker participation in IS design [49], but it is practiced in other EU states [50]. It had its genesis in the explicit political context of the workplace democratization movement, which is supported by codetermination laws [51]. In Germany, codetermination, which is called *Mitbestimmung*, gives workers more influence in the running of companies than in any other of the EU countries [52]; however, approximately 75 percent of EU member states have binding codetermination rules [53]. In the United Kingdom, Spain, and Italy, there are no such laws, and employees are not represented on organizations' supervisory boards [52]. However, ETHICS evolved in the United Kingdom in response to significant problems with IS delivery quality and use, voluntarily accommodating extensive employee participation in IS decisions.

Participatory Design

Participatory design is a systems design method that is supported by codetermination laws in EU countries (described in [13, 54]) as part of their workplace democracy movement [28, 51]. The movement's objective was to improve the working conditions and status of "unionized" employees, empower them to participate in organizational decision making about matters that affect their work practices and give them a voice in workplace decisions [55]. Participatory design emerged as the technique of choice to implement the provisions and intentions of the law [56]; its concepts are also expressed in such terms as social empowerment, cooperative design, and collective resource approach [57].

The participatory design technique was developed by a consortium of university researchers and representatives of organized labor who conducted experiments designed to provide theories and practical collaborative approaches to help systems designers and users establish complementary perspectives and synergies through participation and mutual learning, cross-fertilization of knowledge, and empathy [56, 58]. The idea was to operationalize "codetermination" in systems design and focus on both work content and context in IT adoption decisions [49, 59] and mutual fit between information systems and people [60]. Now

participatory design is a commercial tool offered by major consultancies that have formed their business identities around participatory methods.

There are reports of several successful participatory design projects in a variety of settings [57, 61-63] with claimed benefits and advantages. These include: better systems fit to organizational and user needs; broader use commitment to delivered systems; long-term morale improvements; and reduction in politically motivated abandonment of information systems after implementation [64]; greater consideration for the sociology of the workplace and mutual fit between technical and social systems [60]. However, there are claims that the success of participatory design depends on the specific sociopolitical setting fostered by codetermination [59], which includes a relatively homogenous workforce, a high level of unionization and strong national trade union federations, social democratic parties with strong links to these federations, and a positive attitude toward new technology from the trade union federations [56].

ETHICS

ETHICS is mostly used in the United Kingdom (an EU member nation that does not practice codetermination); it is based on both human-computer interaction and sociotechnical systems principles. According to Mumford, its originator, the principal objectives of ETHICS are to enable users to play significant roles in systems delivery by becoming accountable for effective outcomes and sharing the responsibility for managing organizational change by setting specific job satisfaction objectives, and considering both technical and human factors of systems delivery [65]. ETHICS, therefore, seeks to: 1) contribute to the delivery of acceptable systems and increased job satisfaction and self-realization; and 2) improve the general quality of work life [66, 67]. Under ETHICS, employee participation in information systems delivery is not only a critical prerequisite for eliciting valid system features but also an "intrinsic right" [48, p. 106], and a moral obligation of employers [65].

ETHICS embraces the view that technical and social factors are equally important in determining information systems features; it encourages choices that result in systems that are technically sound, humanistic, and friendly [65, 66, 67]. ETHICS, therefore, considers work and organizational structures, the sociopolitical environment, ergonomic factors, and other job-related elements. It ensures that decisions about information systems features and alternatives are made by stakeholders from all the constituencies into which intended technical systems will be deployed [48]. Users become partners and co-consultants in the information systems design process, develop strategies to achieve their own objectives, and provide early indications of the acceptability of systems and their overall organizational implications [66].

ETHICS can be used in situations beyond the scope of its original intentions; for example, as a problem-solving methodology to assist groups in exploring

opportunities for general performance improvements [67]. Other benefits include: 1) a reduction in the adversarial relationships that characterize conventional approaches, as stakeholders tend to negotiate in good faith and are more likely to reconcile conflicts of interest; 2) improved quality of working life; and 3) enhanced job satisfaction. There is, however, a fairly steep learning curve to get both developers and users to operate effectively in this environment.

Joint Application Design

JAD originated at IBM in the 1970s as an alternative to conventional systems requirements elicitation methods to support systems development. It pools the knowledge and perspectives of system developers, managers, subject matter experts and facilitated, interactive workshops to jointly develop decisions about system features [68]. The D in JAD originally meant "design" but later became "development" to recognize its support for user-developer collaboration in other areas of information systems delivery [69]. It is now known by several other names, such as joint application review, facilitated work sessions, facilitated workshops, accelerated design, facilitated meetings, joint sessions, modeling sessions, team analysis, and user-centered design [49]. Although many organizations have adapted JAD to suit their own circumstances [68], the formal protocol consists of five stages [69]. The first three stages involve preparation for the fourth and most important stage, the workshop, which is a series of facilitated meetings conducted over three to five days, where the major deliberations occur. The final stage is the completion of the documentation of the process results.

JAD emphasizes effective interaction among system users and developers and maximum participation of group members [69]. A competent, neutral, and respectable facilitator is required to guide the meeting toward the accomplishment of the objectives in the available time [49]. The facilitator requires excellent leadership and communication skills, good understanding of interpersonal relationships, and business and systems analysis skills [69]. When applied successfully, JAD may contribute to higher quality requirements [70], reduced scope and feature creep, and lower development costs [71], reduced IS delivery-cycle time (from months to weeks), improved team rapport, enhanced user-developer interaction, increased user involvement in the IS delivery, and greater user identification with the results [68, 69].

However, these benefits are not always realized. JAD teams typically experience several of the relational problems that characterize deliberations by decision groups [70]; social and emotional dynamics of group relationships often impede the accomplishment of team objectives. Facilitation excellence is therefore a pivotal JAD requirement to help overcome potential group problems such as destructive dominance; freeloading—inadequate participation due to unnecessary acquiescence to powerful and influential group members, or simply by election,

because group members contribute of their own volution; and groupthink—the fixation on preserving group harmony [70].

Micro Techniques and Tools

Storyboards

A storyboard is a set of drawings (pictures of the scenes, dialogs, toolbars, and other elements users believe a system should provide) depicting user activities that occur in an existing or envisioned system. It allows computer users and technologists to communicate more effectively in a "common language" in order to capture stories (details of the real-world context in which a new technology will be used) [72, 73]. Storyboards provide a means for users to analyze work practices in a manner that helps them understand their needs and for technologists to communicate their vision of a solution to multidisciplinary stakeholders for their assessment and recommendation.

A storyboard serves as a point of reference and expresses and demonstrates program features to the end user as a test-of-concept model, just short of the final product specification document [73]. It provides look and feel dimensions that give clues about the value of proposed functionality and the feasibility of program ideas and helps to identify omissions and problems that may not otherwise be spotted [72]. Stories are concerned with technology but are not merely about technology. They are about personalities, problems, and difficulties faced by humans as they interact with technology—a focus that is often absent from IS design discussions.

The On-Site Customer

The concept of an on-site customer is a feature of extreme programming (XP), one of the many agile development methods that promote expeditious delivery of small increments of software functionality to maintain user interest and commitment throughout the development of the entire system. This concept is based on the idea that a capable, committed, knowledgeable, and empowered customer should be available to participate in design decisions. This customer keeps abreast of project status and is available continuously during "production" (the development process) to clarify misunderstandings about system features, participate in meetings, and respond speedily to information requests, thereby reducing guesses made on behalf of the user community and improving the quality of decision making [74].

Playscripts

Playscripts have been used by many organizations as a modeling technique for describing and documenting dynamic processes. They can be used to specify

procedures, business rules, and process logic, which are usually captured in a two-column arrangement that describe (in narrative form) the actors in one column and actions and their purposes in another [75, 76]. The technique is patterned after a script in a play, where different actors play different roles in a series of scenes. Complex processes can be partitioned as different plays. Processes that occur in sequence are assigned to the acts of the play, and processes that occur in parallel to other processes in the same act are assigned to scenes [75]. In system design, this technique can be a powerful way to involve users in the description of user interactions with the system in a manner that is easy to communicate and understand.

FOLKLORE

The FOLKLORE method is another technique used in systems development or during systems evolution to capture stories and tales that are shared among users of an information system but are not usually written down [77]. It can be a useful documentation tool, which also encourages user involvement. It is reminiscent of the traditional methods of propagating folklore about people and legends and is conducted through user interviews. FOLKLORE captures and documents information about customs (descriptions of user processes employed to get systems to run), tales (stories about unconventional methods of use and workarounds), art forms (user-generated diagrams and drawings), and sayings (useful aphorisms and heuristics that users share) [78, 79].

Focus Groups and Prototyping

Heterogeneous focus groups, in which members represent a variety of demographic profiles, were first constructed in market research to provide feedback on perceptions of, attitudes toward, and ideas on, particular product features. In IS development, these groups provide multiple perspectives of the user community, unearth attitudes toward the introduction of particular technologies, and provide change-management previews. Prototyping involves close user-developer interaction in generating iterations of progressively refined models of an intended system and user feedback to simulate actual usage experience and obtain proof-of-concept. Prototypes demonstrate the system's appearance and behavior and help discover features the system should provide to solve the problem at hand and isolate design problems [80]. It permits an early assessment of the impact of the system on the user environment.

CONCLUSION

Advances in information technology have enabled several innovations that have assisted organizations in structuring their business operations more effectively; however, this proliferation has caused major changes to the patterns of

interactions and other important features of employee life at the workplace. This paradox is described as "creative destruction" [24, p. 88]. Employees encounter information technology through legions of information systems established to automate the work processes in which they participate and too often, without prior consultation, employees encounter new information systems that alter (sometimes adversely) significant elements of their work practices.

While the use of these systems is not optional, many employees have responded with passive and subtle resistance, thereby preventing the realization of benefits that are obtainable only through effective use. To solve this problem, organizations are increasingly affording their employees the "right" to participate in the design of systems that affect the business processes that comprise their workspace. Outside of EU countries, there are no laws that prescribe participation in information systems development decisions; the accommodation of user-centered design principles has been largely voluntary.

In the U.S. and EU member states that do not subscribe to codetermination, the inclusion of employees in information systems design is not a concession of individual employment rights nor a moral claim to employee participation in the information systems decisions that affect their work processes. Rather, this choice has been encouraged by both the increased dependency on information systems for support of mission-critical operations and the repeated failure of information systems in development as well as their occasional abandonment after deployment, presumably due to the ineffectiveness of conventional, noncollaborative approaches.

Regardless of how organizations arrive at the decision to involve employees in systems development and the approaches they use (we have noted that design philosophies for effecting employee association with information systems development varies in the United States and EU), the espoused benefits—higher quality systems, greater buy-in, and reduced rejection during implementation—according to the available evidence, are not guaranteed by the mere act of inclusion. Scholars have explained the inconsistent research findings by acknowledging potential construct-validity problems with the four progressive gradations of employee association (participation, involvement, ownership, and championship) that are typically used interchangeably in the research literature. The challenge may yet be to cultivate the requisite level of association (along this continuum) that fits the sociotechnical context of the information systems development project, whether such collaboration is legislated (as in some EU countries) or accommodated voluntarily in as the United States.

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