Events, emotions, and technology: examining acceptance of workplace technology changes

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Abstract

Purpose – The purpose of this article is to understand the relationship between emotional salience and workplace events related to technology change by using a combination of key features of two popular psychological theories – regulatory focus theory and affective events theory – to view the change process in diverse settings.

Design/methodology/approach – This paper is based on analysis of 18 months of qualitative interview data (n = 52 respondents) collected before, during and after the introduction of three different new technologies in three organizations – a hospital, a manufacturing facility, and a psychological counseling center. The mixed methods approach combined descriptive case studies and a structured coding approach derived from a synthesis of the two theories with which the transition processes at each organization were examined.

Findings – Employees with a so-called promotion-focused orientation were more likely to accept an IT change and the events related to it. Organizational cultures and the staging of events play a role in individuals’ affective reactions and behavior. The use of the framework is promising for illuminating the role of emotions, the timing of change events, and subsequent behavior in response to organizational change.

Research limitations/implications – The variety of types of organizations and job types represented, as well as the types of IT change proposed in each, provides a rich sample of diverse motivations and scenarios. Further development of the relationships between the timing of organizational events and regulatory focus is needed.

Practical implications – The proposed framework suggests a shift in emphasis away from beliefs and towards emotionally relevant events. The findings suggest consideration of two distinct motivational aspects of both new and old technology. A peak in emotional events related to training indicates that an organization must actively manage how the plans, strategies, and communications with regard to training affect workers’ beliefs and expectations.

Originality/value – The paper highlights how an emphasis on emotionally relevant events and attention to the regulatory focus involved in interpretation of those events could provide the basis for new approaches to organizational interventions. Interventions should focus on facilitating situations where individuals can frame relevant transition events with a promotion focus.

Keywords Communication technologies, Change management, Motivation (psychology), Employees

Paper type Research paper
Introduction
Each type of information technology in workplace use represents a change process through which the technology became known to individuals and groups, and during which these organizational members developed and adapted to new work strategies and methods. Although industry-wide statistics are difficult to obtain, anecdotally it is often reckoned that well over half of the technology initiatives in organizations fail to achieve their stated goals (e.g. Dickie, 2002). Because the extent to which collective and individual productivity in organizations seems to depend on the effective and appropriate use of technology by members, the impacts of new technology on people in organizations have held long and abiding interest for researchers.

Technology diffusion, adoption, and acceptance each refer to overlapping aspects of the human dynamics by which new artifacts become (or fail to become) embedded in the social and business processes of organizations. A widely used model of technology acceptance, Davis's (1989) technology acceptance (TAM) model, predicts individuals’ intentions to use a technology system based on a set of belief and attitude variables that include perceived usefulness and perceived ease of use. Venkatesh et al. (2003) provided a detailed review of various models of technology adoption and acceptance (Ajzen and Fishbein, 1977, 1980; Ajzen and Madden, 1986; Dillon and Morris, 1996) in their development of the Unified Theory of Acceptance and Use of Technology (UTAUT). Davidson's (2006) technological frames model (TFR) emphasized the importance of how employees make sense of technology to outcomes and is one of the foundations of interpretive studies of IS acceptance. There is a rich array of literature on technology adaptation with relevance to our paper (cf. DeSanctis and Poole, 1994; Sadisivan, 2005); we have chosen to concentrate on a concept known as regulatory focus (Higgins, 1997, 1998) that may influence the salience and impact of certain events within the technology change process. In this paper, we ask whether and how the concept of regulatory focus explains why some individuals and groups respond more positively than others to technologically induced change in organizations.

A common thread through the work of Ajzen (Ajzen and Fishbein, 1977, Ajzen and Madden, 1986), and through some models that arose from it, is a focus on cognition rather than emotion. Typically these models examine precursor beliefs, such as the perceived usefulness of the technology, that influence attitudinal evaluations of technology. The models then assess the influence of those attitudes on subsequent workplace behavior or behavioral intentions involving that technology. In more recent statements of TAM/UTAUT, these belief variables have been used to predict behavioral intentions directly. Absent from these formulations is the consideration of emotional constructs that may serve as precursors to attitudes or behavior. However, recent work on motivation and emotion in organizations (e.g. Ashkanasy et al., 2002; Weiss and Cropanzano, 1996; Weiss, 2002; Fineman, 2003; Ciborra, 2001) suggests that emotion has been underemphasized. McGrath (2006, p. 281) has researched this concept within IS research and explains that the dominant model is to ignore emotions altogether, and a secondary approach acknowledges the existence of emotions but fails to give them analytic attention. McGrath and others (e.g. Wastell, 1999; Ciborra, 2002; p. 162) embrace an approach in which feelings receive direct attention and the aim is to sort out organizational members’ emotions and the role they play in IT change.

Fortunately, there is emerging theory to help support this third approach. Developments by organizational theorists such as Weiss (2002, p. 178) and Brockner
and Higgins (2001, p. 56) suggest that events and emotions in organizations play important roles in influencing employees’ attitudes and behavior. There is also a growing body of literature about the role of emotion in IS adoption that recognizes the complexity of the relationship between them. Wastell (1999), for example, outlined social defenses that employees use to reduce anxiety related to change. Venkatesh and Speier (1999) found that individuals receiving a negative intervention on mood caused a decrease in intrinsic motivation and diminished the likelihood of using the focal technology. In their case study of a Greek social service agency, Avgerou and McGrath’s (2007) findings led them to question the centrality of technical/rational thinking in IS innovation. In each of these examples, the notion of IT-related organizational change as personally and interpersonally affecting stands in contrast to previous works’ predominantly cognitive orientation, and is central to our study. Rather than taking a negative or conflicted view of emotions in the workplace as has been done often in IS research (McGrath, 2006), we seek to expand our understanding of the possible motivating force intrinsic in the concept of promotion focus. The organizational context of the IT change, combined with the affective reaction of individuals to technology-related change events, may shed light on subsequent outcomes.

In this paper, we report the results of an 18-month interview study that examined technology-driven events and emotion in three diverse organizations — a hospital, a manufacturing facility, and a psychological counseling center. We sought to understand how emotions and workplace technology-related events were connected in different contexts, with the first step being to learn how to categorize emotional statements and to identify emotionally laden events. We developed our ability to identify emotion, regulatory focus, and events through traditional qualitative analysis of the interview transcripts. Then, we explored the extent to which respondents’ discussions of technology-related change events in their organizations reflected some of the ideas proposed in our research framework of the merged theories. It was important to view each organization as a separate case because the context, the mode of introduction, and the scope of the proposed changes differed in each organization and may have had an impact on emotional framing and subsequent reactions. Although the generalizability of our results is bounded by the limited number of cases, one beneficial outcome of our study may relate to the improved ability to identify and describe the emotional assessment of employees and the nature of the IT-change related events in a variety of organizational contexts.

Consistent with qualitative (Denzin and Lincoln, 2005; Wolcott, 1999) and case study methodologies (Eisenhardt, 1989, Yin, 2003) used in the IS field, we conducted in-depth interviews and structured observations of workplace processes, and then transcribed and analyzed the interviews and field notes as a team. We began our analysis with the empirical evidence and treated Regulatory Focus Theory (Higgins, 1997, 1998; Brockner and Higgins, 2001) and Affective Events Theory (Weiss, 2002; Weiss and Cropanzano, 1996; Weiss et al., 1999) as appropriate and compatible partners to assist in the analysis. Although we recognize the many other factors that might enter into the organizational outcomes related to these IT changes, we focused our attention on these two compatible theories and their potential for framing the connections between emotional assessments and the events and timeline of IT change for employees.
Events and emotions in workplace acceptance of change

Affect, an umbrella term often used to describe a range of emotion-related constructs, is taken by many researchers to comprise both moods and discrete emotions (Frijda, 1993; Isen and Baron, 1991). The commonsense ways of differentiating between mood and emotion on the basis of labels such as “feeling blue” or “really angry” can be supplemented by comparing two characteristics of affect:

1. duration; and
2. object.

Moods have long durations measured in hours or days, whereas discrete emotions have shorter durations measured in seconds or minutes. The distinctions between emotions, attitudes, and beliefs have sometimes been quite blurry. Weiss (2002) asserted that when researchers measure attitudes using self-report measures such as surveys, the cognitive component of an attitude dominates, to the detriment of understanding the affect involved in the individual’s reaction to the attitude object.

Below, we describe two key theories that have been used individually to explore affect and reactions to organizational change. Part of the contribution of this paper is to integrate the aspects of each theory that are relevant to how the individuals react to technology change within a specific context. Our integration of these two theories allowed us to explore the connection between individuals’ emotional framing (promotion-focused versus prevention-focused) of IT change-related events and the outcomes of the change. As a result, this research may be useful as a basis for future research on emotional aspects of worker motivation as well as useful to practitioners in charge of managing organizational change.

Regulatory focus theory (RFT)

RFT analyzes motivation and emotion as they relate to two sets of universal needs that people have:

1. growth/development needs; and
2. security needs (Higgins, 1997).

The theory distinguishes between conditions that can generate positive emotions as a result of gains (i.e. the satisfaction or achievement of growth and development needs) and conditions that can create negative emotions resulting from losses (i.e. through failure to satisfy security needs). In any given situation individuals take on one of two motivational orientations, promotion focus, which is all about the pursuit of an ideal goal, or prevention focus, which concerns avoiding or averting unpleasant outcomes. The experience of emotion in response to environmental conditions differs depending upon one’s regulatory focus, which has both a stable individual difference component and a situational component. Prevailing conditions shift one’s regulatory focus depending upon whether one sees the likely outcome of a situation as a gain or a loss, but Brockner and Higgins (2001) also suggested the existence of a stable trait that predisposes some people towards one focus or the other. Substantial support for RFT has appeared in a variety of areas, including the effect of regulatory focus on creativity (Lam and Chiu, 2002), decision-making (Brockner et al., 2002), motivation (Foerster et al., 2001), and organizational behavior (Levine et al., 2000; Liberman et al., 2001). Brockner and Higgins (2001) developed an application of RFT for workplace settings.
Affective Events Theory (AET)
AET offers a model of emotional experiences that sees workplace events as the cause of emotional experiences and identifies time as a key factor in the relations between events, emotions, evaluations, and behavior. The structure of affect (e.g. moods versus emotions, positive versus negative) is an important determinant of behavioral implications (Weiss and Cropanzano, 1996, p. 11). Affective experiences include both moods, which impact how one interprets an event, and emotions, which constitute the reaction to a specific event. Emotions tend to be shorter in duration yet more intense than moods, and at sufficient intensity they directly and immediately impact thought processes and behaviors (Weiss and Cropanzano, 1996). AET suggests that features of the work environment (e.g. authoritarian management) can often lead to workplace events or “shocks” of a certain type in the workplace (e.g. a new technology is deployed without employee input) to which the employee displays an emotional response (e.g. feels angry). An employee’s emotional response leads to subsequent behavior, either immediately during the experience of intense emotion (affective driven behavior), or much later after things have cooled down and solidified into an attitude toward the event (judgment-driven behavior).

Several studies have supported AET (e.g. Wegge et al., 2006; Fisher, 2002; Weiss et al., 1999). Pirola-Merlo et al. (2002) found linkages between workplace events that provided obstacles to team performance and team leader responses to these events. Fuller et al. (2003) used a time series design to examine stress-inducing events over a period of four months and found that job attitudes and stress varied in direct response to workplace events. Fisher (2002) examined employees over a two-week period and found that measures of mood and emotion in the workplace accumulated to influence job attitudes, thus supporting the notion that affect and attitudes are not the same constructs. Taken together, these findings provided empirical support for Weiss and Cropanzano’s (1996) model by confirming that emotional reactions to workplace events impact subsequent attitudes and behavior.

Researchers using AET have found that positive and negative emotional events are not simply mirror images of each other. For example, Fisher (2002) found that positive affective reactions to workplace events predicted increased organizational commitment and helping behavior but negative affective reactions did not predict reduced organizational commitment. Although AET does recognize that different emotions have distinctive consequences, the theory does not make predictions about different behavioral responses to positive and negative emotional reactions.

The introduction of a new technology into the workplace can offer substantial personal benefits to some workers with respect to productivity, job opportunities, and career development, while creating adverse situations for others. Thus, in contrast with other notable workplace events, such as downsizing, which typically represent only negative implications, technology-driven change offers possibilities for events that imply both gains and losses for workers.

Theory synthesis
We develop our synthesis of the two theories by inserting RFT into the early stage emotional processing that Weiss and Cropanzano (1996) described for AET. Building upon Frijda (1993) and Lazarus (1991), Weiss and Cropanzano (1996) described the initial process of emotional reaction to workplace events as “intricately tied to one’s
personal set of goals and values" (p. 32). The positive or negative tone of the emotional reaction thus arises from how it may impact one’s personal goals and preferred states. They state that the individual’s state of mind at the time of the event provides a kind of filter that frames the nature of the events with respect to the individual’s goals (Davidson, 2006). Significant workplace events such as layoffs, promotions, raises, and so forth often bear upon either growth or development needs or security needs. Thus, an individual’s regulatory focus sets the person up to react to an event in either a more optimistic (promotion focused) or pessimistic (prevention focused) light.

Both the emotional and the subsequent behavioral responses to an event depend upon the event’s significance with respect to the individual’s predominant regulatory focus. Figure 1 depicts graphically the dynamic effects of events as they might unfold for a hypothetical worker in an organization. With respect to any one of these events, an individual has a predominant regulatory focus (promotion or prevention) that is a function of both stable individual differences and the situation. The meaning of a given event is interpreted through this predominant regulatory focus and leads to the characteristic emotional reaction as predicted by RFT, and in turn influences the individual’s future regulatory focus. When an individual interprets an event through a promotion focus, the resulting behavior is generally an approach behavior, while a prevention focus tends to engender avoidance behavior. In Figure 1 we have divided behaviors into a preparatory phase – to reflect the period of time before the actual technology is available – and an adaptive phase when one may either approach or avoid the new technology. Approach behaviors during the preparatory phase might include participating in developing vendor lists, specifications, and requests for proposals as well as attending vendor demonstrations and planning meetings. Avoidance behaviors during the preparatory phase might include postponing, canceling, or skipping planning meetings, finding ways of slowing the vendor selection

![Figure 1. An emotion-focused model of adaptation to technology](image-url)
process, delaying the installation of the new technology, or trying to convince coworkers that the new technology is unlikely to succeed.

By inserting RFT into the emotion-behavior linkage of AET, we clarify the framework’s predictions about the nature of emotional experience and the direction of subsequent behavior based on the individual’s regulatory focus and the interpreted valence of the event (see Table I). A promotion-focused individual will respond to a positive event with cheerfulness and a negative event with dejection; subsequent behavior will focus on adaptation to the consequences of the event in light of the individual’s growth and development needs. Brockner and Higgins (2001) also assert that this behavior will comprise “strategic approach means to attain a desired end-state” (p. 48; emphasis added). We interpret the phrase “strategic approach” as signifying goal-directed, achievement-oriented behavior in pursuit of personal ambitions.

In contrast, a prevention-focused individual will respond to a positive event with quiescence and a negative event with agitation; subsequent behavior will focus on adaptation to the consequences of the event in light of the individual’s safety and security needs. Brockner and Higgins (2001) assert that this behavior will comprise, “strategic avoidance means to attain a desired end state” (p. 48; emphasis added). We interpret the phrase “strategic avoidance” as signifying protective, vigilance reactions focused on threat reduction or removal.

As an important note to close this section, in their literature review Brockner and Higgins (2001) turned their attention specifically to the problem of resistance to organizational change. They suggested that employees’ resistance to change might take two fundamentally different forms depending upon its focus. Promotion-focused resistance to change might occur when employees feel that the nature of the change blocks their achievement of desired job or career goals. Prevention-focused resistance to change might result when employees worry that the nature of the change might prevent them from living up to their responsibilities.

In order to examine events and emotion in relation to workplace events surrounding IT change, we analyzed interview data from three different organizations over the course of 18 months of technology-driven change. We examined how employees discussed workplace events related to the technology changes that these organizations had in store. In accordance with AET’s focus on the importance of time, we differentiated between past organizational events (e.g., past technology failures or problems) versus current events that pertained directly to the organizational change in progress (e.g., announcements, vendor selection, personnel changes, training). We explored the nature of employees’ emotional responses to the events with particular attention given to whether events were framed in a promotion focus or a prevention focus. The events and reactions to them, both emotional and behavioral, reported from

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<th>Predominant regulatory focus at the time of event</th>
<th>Interpretation of event relative to personal goals</th>
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<td>Positive event, beneficial to personal goals</td>
<td>Negative event, harmful to personal goals</td>
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<tr>
<td>Promotion focus</td>
<td>Cheerfulness (high intensity)</td>
</tr>
<tr>
<td>Prevention focus</td>
<td>Quiescence (low intensity)</td>
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Table I. Four emotional reactions described by regulatory focus theory
our three organizations may provide a preview of whether and how future research might fruitfully examine the role of employees’ emotions in the processes of technology-driven change.

Method. We analyzed, in detail and over time, events related to technology-driven change in three small to medium-sized organizations:

(1) a suburban hospital;
(2) a manufacturing company; and
(3) a large psychological counseling center.

We consider our study mixed methods research, with an emphasis on construction of contextualism and the importance of case studies as is common in IS (Yin, 2003; Paré and Elam, 2002; Walsham and Sahay, 1999; Barrett and Walsham, 1999, Orlikowski and Yates, 2006) using qualitative interviews (Rubin and Rubin, 2004) and systematic observations. Mixed methods is becoming more popular in IS in recent years (Kaarst-Brown and Guzman, 2008), suggesting the possibility that complex subject matter can be examined with more depth and credibility using these techniques. Our emphasis on the emotional characteristics of specific organizational events required a nuanced view of the context and timing of the events as well as the nature of the planned change. We also employed quantitative data to contribute to the description and measurement of the organizational context and evidence for the two theories in question. Informing our methods were Creswell’s (2006) mixed methods expertise (see also Tashakkori and Teddlie, 2002) and Walsham’s (1995), Orlikowski and Baroudi’s (1991), and Orlikowski’s (1996, Orlikowski and Hofman, 1997) research experiences in IS. For example, Orlikowski’s improvisational model for managing change recognizes change management as more like an “ongoing improvisation than a staged event”. This improvisational condition was operative in all three of the sites we studied.

Data collection
Choice of cases
Representatives from dozens of organizations contacted the researchers and volunteered their groups’ inclusion in the study in response to local press coverage of the project, representing a convenience sample. These three particular organizations were chosen for this study because they differed substantially from one another in terms of their missions and the nature of the planned new technology. Within each organization, every effort was made to include an array of relevant job titles and responsibilities. Through a series of meetings, interviews, and structured observations, our small teams learned about the organizations and planned changes, and constructed the case studies.

Instrument
We designed the interview protocol in accord with open-ended research questions identified in prior work on technology-driven organizational change (e.g. Stanton and Weiss, 2000). In keeping with common practice in qualitative research (Smith, 1995; Maxwell, 1998), we gradually evolved the line of the questioning to match our growing understanding of the phenomenon under examination. Setting aside some variations and customizations, the core of the interview protocol (see Appendix 1) consistently covered areas such as general work experience and responsibilities, workflow using
the IT system, knowledge about upcoming IT changes, and concerns about the potential effects of a new system on the quality of work life. The interview protocol was not designed to elicit specific responses related to emotional reactions or regulatory focus.

**Procedures**

We began by recruiting and training a team of eight interviewers from among our graduate students. The interviewing team underwent a training process that included mock open-ended interviews that we videotaped and critiqued in a group. Respondents often change the nature of their answers to fit their organizational and personal circumstances, so interviewers were trained to adjust their subsequent lines of questioning accordingly. Interviewers also received training on writing encounter notes after completion of each interview that captured the overall “flavor” of the interview situation and any unusual events that occurred during the interview (see Rubin and Rubin, 2004).

Supervisors within each organization recruited volunteers to participate in the 30-40 minute semi-structured interviews. The researchers encouraged participation by new and veteran members of multiple departments, as well as individuals with and without supervisory responsibilities. With the permission of the respondents, interviewers audiotaped all but four of the interviews. Encounter notes suggested that about a half dozen of the respondents were uncomfortable with this guarantee and may have given guarded responses out of a concern that the responses would become known to managers or supervisors. The remainder of the encounter notes and the transcripts themselves suggested that the great majority of respondents were comfortable with the interview situation as well as forthcoming in their responses.

The data collection was conducted in the form of multiple waves of semi-structured interviews with 52 different respondents. In addition to qualitative analysis of the data corpus, we used a structured coding scheme to identify 391 emotionally meaningful events that served as the subject of our analyses, interpretation, and discussion. Table II provides information about the number of respondents and the number of interviews at each stage.

**Data analysis**

*Transcribing and coding*

The interviews were transcribed verbatim, in many cases by the interviewer, including non-verbal material such as laughter. Identifying information, such as the names of coworkers and products, was also elicited at this stage. The gender and age of the respondent appeared at the top of each transcript. We grouped transcripts by wave and by organization, and inserted them into the Atlas.TI program for qualitative data analysis such that the transcriptions in each group appeared sequentially in a file.
containing the complete corpus of data, which contained approximately 220,000 words, or 700 pages of double-spaced text.

To develop our coding scheme, we began by searching for passages in the transcripts that were relevant to workplace events and emotions. Using these passages as examples, we brainstormed a system of codes that seemed to adequately represent the meanings and concepts apparent in the interviewees' responses. To accompany the system of codes, we developed detailed instructions, including examples of when to apply and when not to apply a particular code (Carey et al., 1996; MacQueen et al., 1998). We then tested this system by selecting a lengthy passage at random and asking two coders to analyze the same material and cross-checking their work by calculating the percentage of agreement between their strings of code assignments. This process required three complete iterations before we achieved acceptable agreement between coders together with an acceptable correspondence to the theoretical constructs of interest. With the third and final coding scheme (see Appendix 2 for a sample coding scheme), the coding team applied a closed list of terms for regulatory focus (prevention, promotion, or neutral), workplace events (beneficial, harmful, or neutral), and time (before the change, time of announcement, transition, and future). Additionally, the authors identified a constrained set of descriptive categories of events by tracing back from the regulatory focus, and coded these descriptors as well. Using this method, the coders achieved 94 percent agreement on a set of randomly selected passages. Cross-checking of this material uncovered very few substantive coding errors; most errors pertained to the size of the selected passage rather than the applicability of the selected code. Post-implementation data (i.e. the final wave of interviews) was additionally coded for behavioral outcomes with separate categories for approach behavior and avoidance behavior relevant to the new technology system.

Overview of the setting and events for each case
In order to provide context for the events and regulatory focus of the individuals, we provide background context here and organize the cases by organization. The cases were chosen because they are so different and they represented a range of possible organizational behaviors and reactions. To combine them prematurely in our analysis would obscure the key point that the events occur in a context involving emotion, contextual factors such as power and authority, as well as the history of the technical decisions to that point. The complexity of the events did not, however, hinder our ability to categorize them. The events were identified inductively from the interviews, and mostly focused on the planned technology changes but in some cases included wider organizational changes as seen relevant by the respondents.

The case of the hospital and a new enterprise information system
The first case involved an accredited regional hospital serving both rural and suburban areas with emergency, diagnostic, inpatient, and outpatient services. At the hospital, a new enterprise information system was adopted to replace three overlapping legacy systems that had been in place for a decade or more. Hospital management chose to adopt the new enterprise system to simplify retrieval and data input procedures, improve communications among departments and with outside stakeholder groups, and facilitate the work of IT service providers. We conducted the initial waves of interviews when employees had heard that a new system was planned,
but several months in advance of the selection of a vendor. The department most profoundly affected was the laboratory, and thus we focused our interviewing efforts on laboratory technicians, phlebotomists, and the director of the laboratory. We continued data collection through the periods of vendor selection, employee training, and going live with the new system, and followed up over the subsequent three months.

At the hospital, the 133 emotional events that were reported mainly reflected interactions with other individuals or groups in the work environment. The following were described as meaningful events:

- meetings with an outside accreditation team;
- internal committee meetings;
- requests for assistance from patients;
- chance hallway conversations; and
- telephone conversations with doctors.

Events pertained to the new information system itself and included the announcement of the system selection, off-site training activities, and the initial availability of a mock system for trial run activities.

The case of the manufacturing facility and a new manufacturing resource planning system

The second case we examined was a manufacturing facility whose primary organizational mission was to provide the community with a variety of vocational and habilitation services for approximately 700 mentally and physically challenged individuals. This organization trained and employed high-functioning members of this group to work in its manufacturing operations. The organization was operated by professional staff: executive management, finance, human resources, information technology, and manufacturing management. To improve the manufacturing operation, the executive and information technology teams had decided to adopt a new manufacturing resource planning (MRP) system that would replace an ad hoc collection of database, spreadsheet, and financial software systems. We began our data collection prior to vendor selection by interviewing the most substantially affected employees (accountants, production managers, and manufacturing floor supervisors), and continued data collection through vendor selection, employee training, and going live with the new system, as well as follow-up data collection about one month after going live.

At the manufacturing plant, the 131 events pertained to respondents’ descriptions of the technology transition. In particular, many significant events involved workplace encounters with other people at vendor selection meetings and presentations, or chance encounters with coworkers, production supervisors, and the information technology manager. As with the hospital, other significant events pertained to the new system itself, such as the arrival of the new system, one-on-one training, the process of transitioning the data from the old systems to the new one, and situations where coworkers enacted the wrong procedures with the new system.
The case of the psychological counseling center and a new scheduling system

The third organization was a psychological counseling center that primarily served low-income clients in an urban area. The focus of the organization on under-served clients provided unique challenges with respect to fees and insurance reimbursements. At the time of our initial contact, the center used a paper-based system of tracking appointments, encounters, payments, and reimbursements that comprised over 50 distinct paper forms. The management planned to move its record-keeping to a computerized system that would centralize the scheduling of counselors, tracking attendance of patients, and improve financial record-keeping. In the end, budgetary constraints prevented complete deployment of the planned system. Instead of complete automation, clerical staff played an intermediary role by processing the necessary information from and subsequent feedback to the counseling staff.

At the counseling center, respondents reported 127 events, focusing more on past occurrences that had adversely affected them in a personal way. These included situations where they were obliged to repeat a task unnecessarily due to limitations of the old methods, or when the old procedures had resulted in a loss of their data. In parallel with the other two cases, some significant events involved interactions with others, such as notable meetings with the organization’s executive director.

Results

Overview of regulatory focus and events

Next, we present an overview of the regulatory focus and its relation to the employees’ appraisal of events at each organization, and illustrate them with accounts from respondents from each organization. We then differentiate categories of events related to the technological change (e.g. training, co-workers, IT staff) and show how the regulatory focus of the comments was distributed over time. Finally, we describe the employees’ subsequent self-reported “approach” and “avoidance” behaviors related to the new system.

In our initial analytical steps, we analyzed the transcripts to identify regulatory foci and the primary appraisal associated with significant IT-change related events. Using the Regulatory Focus perspective we inferred the motivational focus of the individual (i.e. promotion versus prevention), while from the outlook of Affective Events Theory, we assessed the primary appraisal of anticipated benefits or harm that the event represented for an individual. For example, considering a promotion-focused individual, a “beneficial event” might be the acquisition of a new information system. For this same individual, a “harmful event” might be the selection of a new system that was perceived as inferior to another available system. For a prevention-focused individual, on the other hand, an example of a “beneficial event” could be to receive adequate training so that a stressful transition could be avoided, while a “harmful event” could a situation where employees started using the new system without having acquired the proper skills.

For each identified event, after a first coder had identified the respondent’s regulatory focus with respect to the event, the event was independently classified by a different coder as beneficial or harmful based on the apparent or anticipated outcomes of the event. In Table III, we present a summary of the coding results for regulatory focus and primary appraisal of the events in the three organizations based on the first round of interviews shortly before the IT change. Table III clearly suggests a
correspondence between regulatory focus and anticipated benefit or harm with the preponderance of coding combinations (in italic) on the diagonal. Only individuals who would be directly affected by the technology change were included in the study. Our goal was to evaluate the accounts of events and not to categorize the research participants by their focus. However, it became clear that prevention-focused individuals tended to report many harmful events and fewer beneficial events, whereas promotion-focused individuals exhibited the opposite pattern. Most event-related comments were coded as harmful and prevention-focused. The next largest grouping was event-related comments coded as beneficial and promotion focused. Note for later reference that the manufacturing facility differed from the other two organizations in having more than twice as many beneficial/promotion-focused events than harmful/prevention-focused events.

Illustrations of regulatory focus of events
Several example excerpts from our data, such as the one below by an administrative secretary, can more clearly illustrate the entries from the two predominant categories on the diagonal. It should be apparent that sorting by regulatory focus was a complex endeavor in many cases, because of the richness of the data and the need to constantly reevaluate the event or feeling to which the respondent was referring. The use of emotionally loaded words such as “love”, which would be characterized as promotion-focused, was spontaneous as well as typical of many respondents:

R (respondent): I walked into the medical field with no experience of medical terminology. The computer experience was probably what sold them on me. That’s why I’m here – and I love it. Everyday there’s something new I learn. You would think that after 3 years you’ve learn it all but you haven’t – you’re still learning!

The following example from the manufacturing facility is another promotion-focused framing of the situation relating to the respondent’s experience with vendor demonstrations:

I: How are the vendor presentations you went to last week?
R: Interesting. Good to hear all of the things that are available, and what it can do. It’s going to take a lot to get everything that we do to work on there, but I was excited about what I heard. I: Do you see some benefits to having this new software?
R: I definitely do. We need it. We have been behind in society for a little bit.
I: Do you think that it will make your life easier or more difficult?
R: More challenging I think. It will give me a different direction to move in, and I look forward to the challenge.

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<tr>
<th>Promotion-focused</th>
<th>Beneficial appraisal</th>
<th>Harmful appraisal</th>
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<td>Hospital</td>
<td>Manufacturing facility</td>
<td>Counseling center</td>
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<td>41</td>
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<tr>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Table III. Regulatory focus and anticipated event harmlessness
Prevention-focused individuals such as the laboratory technician whose comment appears below tended to focus on the negative ways the change might emotion them and what they might do to avoid unpleasant consequences. This individual would like to prevent the trouble involved in learning the new system unless she is absolutely sure that it will make her work life easier:

I (interviewer): You have probably heard that they are considering changing to a new system.
R: I would consider changing to a better system. But if it's going to be the same type of system, I would rather keep the problems I already have. I know this system. If something happens, I know what to do and I know where to go and I know how to fix it. If we get a new system, and it's equivalent to the system I have, there's no use in changing, because it's going to be another bout of trying to relearn.

Another prevention-focused comment described the administrative staff's lack of confidence in the manufacturing supervisors' computer skills and competence:

R: I am just nervous because I don't know how they can have a supervisor do what I do and keep it all together. To have nine different supervisors out on the floor doing the input, that frightens me. Too many hands in the pot doesn't make a good soup.

In the next example, a supervisor's prevention-focused response referred to how the inventory capabilities of the new system will help him avoid his current problems and inability to make predictions:

R: In my work, it will help my availability of information on inventory and ordering, and my ability to respond to an order without any bumps. It should make the ordering and my job easier, from what I understand the way it's going to be. If I don't have that thought that I am not going to be able to produce something I need to produce because I have confidence that that 16 items are on the shelf to make 300 items. As long as that happens, I am going to be one happy guy.

Counselors' prevention-focused comments about the new system, particularly about the possibility of giving up control over their schedules, were plentiful:

R: It might be useful, I could do the notes and the schedule, and I could plug it in if something happened, but if it is stuck in my office, it's not going to work. It's going to really make me stress because I am going to be sitting at the other side and have someone cancel. I'm not to be able to do my paperwork because my computer is over here and I am going to be mad!

Thus, in these three organizations, meaningful events related to the information technology changes were generally considered beneficial (gain) by promotion-focused individuals and harmful (loss) by prevention-focused ones. The reverse was rarely the case; that is, it rarely occurred that events were considered harmful (non-gain) by promotion-focused individuals and beneficial (non-loss) by prevention-focused ones.

**Sequential distribution of event appraisal**

Next, we combine the events of each organization and analyze event appraisal separately across three stages:

1. regulatory focus related to events prior to the adoption of technology changes;
2. events concurrent with the adoption; and
3. events following the adoption.
Presumably, reports of relevant events prior to the adoption pertain primarily to the pre-existing technology and the opportunities and pitfalls it provided. Reports of events at the time of adoption of the new IT system reflect individuals’ experiences and anticipation of IT-related change events such as vendor demonstrations or training sessions. Finally, reports of events after the adoption reflected individuals’ ruminations about the potentialities – positive and negative – that would affect them once the system was fully implemented and running normally.

In examining the pattern for the three organizations, it became apparent that each organization differed in how the proportion of events shifted across the period of IT change (see Table IV). Data for the hospital employees indicated more than twice as many prevention-focused events than promotion-focused events at the start but an equal proportion by the end. This pattern seemed to suggest that events related to the old technology were quite problematic but that the events related to the new system represented some improvement. The manufacturing facility began with an equal proportion of prevention-focused events and promotion-focused events at the start but ended with three times as many promotion-focused events. This pattern suggested a high degree of success in implementing the new system and seemed to imply that many respondents found substantial growth opportunities in the new system’s functions. Finally, the counseling center began with twice as many prevention-focused events as promotion-focused events and ended in roughly the same state. This result would suggest no net opportunity gains for the respondents with respect to the new IT. Examining the overall row and column totals, one might project that the manufacturing firm exhibited the greatest success in having the new IT system become a source of opportunities and positive challenges for employees, with the hospital close behind.

Categories of events, regulatory focus and time
Looking at the coding of regulatory foci in our data, we traced back to the reported event associated with each code, and categorized events into two groups. Within each set we found four distinct categories and we tallied their frequencies according to regulatory foci. Examples of some typical promotion-focused events from the past were interactions (i.e. meetings, conversations) with the IT staff, co-workers or management that the respondent viewed as positive to the quality of their work life or the successful completion of work-related tasks (see Table V). Examples of prevention-focused events from this period consisted of “irritating” interactions with the current computer system (i.e. inadequate capabilities, malfunctioning software or hardware) and events regarding compliance with outside regulations (e.g. HIPAA). We separated the events

<table>
<thead>
<tr>
<th>Time</th>
<th>Hospital</th>
<th>Manufacturing facility</th>
<th>Counseling center</th>
<th>Total</th>
<th>Hospital</th>
<th>Manufacturing facility</th>
<th>Counseling center</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>13</td>
<td>14</td>
<td>9</td>
<td>36</td>
<td>38</td>
<td>14</td>
<td>27</td>
<td>79</td>
</tr>
<tr>
<td>At/near</td>
<td>5</td>
<td>41</td>
<td>5</td>
<td>51</td>
<td>25</td>
<td>13</td>
<td>15</td>
<td>53</td>
</tr>
<tr>
<td>After</td>
<td>25</td>
<td>38</td>
<td>27</td>
<td>90</td>
<td>27</td>
<td>11</td>
<td>44</td>
<td>82</td>
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<tr>
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<td>43</td>
<td>93</td>
<td>41</td>
<td>177</td>
<td>90</td>
<td>38</td>
<td>86</td>
<td>214</td>
</tr>
</tbody>
</table>

Table IV. Appraisal and time of event relative to adoption of IT changes
A number of interesting patterns emerged from examination of Table V. First, considering events related to social interactions, one might note a uniform distribution of events both over time and across regulatory foci. The major exception to this pattern lays in the prevention focused interactions with IT staff members before the technology adoption. It was plain that crashes, bugs, system failures, and other problems with the old system provided a forum for prevention-focused interactions. IT staff members are called or show up whenever a system problem appears and thus interactions with these personnel always seemed to be associated with losses of data, productivity, and time.

This pattern was echoed in the many prevention-focused events associated with the current system prior to the announcement of the technology change. Together, the social interactions with IT professionals and the adverse events associated with the current system make the organizations’ respective motivations for adopting the new system plain and reinforce the meaningfulness of workers’ negative emotional experiences with the current IT system as a significant index of the possible benefits of system change.

Next, note that all events relating to training peaked at or near the time of adoption of the new system, most of which preceded the actual training activities. Instead, these events represented announcements about training, training planning sessions, scheduling, and so forth. In some cases that actuality might represent loss for the individuals who doubt their ability to adapt or fear the loss of certain capabilities of the old system, while in others that actuality may represent gains and positive challenges. This peak in emotional events related to training hinted that an organization must actively manage how the plans, strategies, and communications with regard to training workers on the new system influences workers’ beliefs and expectations.

Finally, emotional events related to the new system grew substantially in frequency as the announcement of the system occurred followed by the actual installation of the new system. Although there were more events in the promotion focused category than in the prevention-focused category, both categories demonstrated a similar pattern of

<table>
<thead>
<tr>
<th>Time</th>
<th>Co-workers</th>
<th>Clients</th>
<th>Management</th>
<th>IT personnel</th>
<th>Current system</th>
<th>Personal concerns</th>
<th>New system</th>
<th>Outside regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotion-focused</td>
<td>Before</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>4</td>
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</tr>
<tr>
<td></td>
<td>At/near</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td>7</td>
<td>1</td>
<td>18</td>
<td>26</td>
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<td></td>
<td>After</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>73</td>
</tr>
<tr>
<td>Prevention-focused</td>
<td>Before</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>39</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>At/near</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>22</td>
<td>18</td>
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<tr>
<td></td>
<td>After</td>
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<td>2</td>
<td>5</td>
<td>8</td>
<td>49</td>
</tr>
</tbody>
</table>

Table V. Categories of events relative to time of new IT adoption
growth. This pattern suggested that experiences of the actuality of the new system became more frequent as time passed and workers interacted with the new system. Together, the patterns for interactions with IT staff, experiences of the old system, training on and learning the new system, and experiences with the new system formed a predictable arc over the process of technology change.

Outcomes: transition processes and subsequent behavior
In this section, we describe how the organizational IT transitions turned out in the three cases and by tallying the approach and avoidance behaviors toward the new system. We illustrate the organizational IT transitions using responses that show the concerns before the change, experiences of training, and the reactions after the change in close proximity with one another. We then examine behaviors as reported in the final round of interviews, conducted between five weeks and three months following the IT change, depending on the nature of the change and the preferences of each organization.

IT transition at the suburban hospital. The hospital provided the greatest amount of formalized training among the three organizations, with basic on-site computer training for some and off-site training for others who later acted as expert resources. Respondents reported that the implementation was relatively smooth and off-site training was positive. After the initial training was complete, the system went live on the same day throughout the whole organization. The “going live” event occurred in conjunction with organization-wide celebrations and the presentation of gifts designed to encourage positive attitudes about the new system and accompanying changes in work life.

Our follow-up interviews with laboratory employees occurred about five weeks after the implementation of the new system. From the perspectives of the organization’s implementation team, this style of training was very effective because it encouraged widespread distribution of knowledge and skills among staff. In comparing this transition with the implementation of a different system two years earlier, this technician describes the new system with enthusiasm:

QUOTE: This one went much smoother (than the previous transition), because of the way the vendor gets more people involved in the training. They train the trainer. Many more people are intimately involved in it. Most of the problems that happened were implementation user type of problems but nothing that had to be corrected by somebody else. Now we know how to do it and the information is spread out between us. Not like the old Soviet Union, where this country only knew how to do that and this country only knew how to do that. The information that we have is universal. A shared body of knowledge was seen by this respondent and others as very positive for the department and the organization. He continues, explaining that based on his previous experience with this kind of IT change, he and his co-workers had expected the transition to be more difficult than it was. They were surprised and pleased at the ease of the transition:

R: The first night, we stayed 24 hours the first days, you know, because we expected it to bad, and it wasn't that bad. I was helping nursing supervisors do things that weren't even related to my module, because I knew enough to help them, because of what I knew, I could help them in house. That was all part of the plan, that people would be around, before we had to call people or change things around.

Like other respondents, he was enthusiastic about the “train the trainer” method used by the vendor and impressed with the quality of the new equipment:
R: Their philosophy of doing this seems to work out pretty well. You feel a little uneasy going in because they seem to be leaving you with a lot of responsibility but that means you know more, and what you have in your head is what you need to know. So all in all, very, very good. Hardware wise, it’s great. Like a bolt of lightning. It hasn’t even blipped, not even once.

On the other hand, some laboratory staff found that the transition was too abrupt and they did not feel comfortable with how little training they received and the demands of their routine work while they tried to learn the new system. This administrative assistant explained her efforts to comfort other staff members who felt stress about learning the new system:

R: It’s actually a little easier because everybody is on the same page, not so much demand on me. They can demand anybody because we are all at the same level, except for [two staff members with previous experience elsewhere], who are the kings of the system.
I: Do most people go to them first?
R: Yes, but if they don’t feel comfortable, then they come to me or go to [female IT staff] or somebody who they feel speaks on their level. They’ll just nonchalantly blow them off or assume that they know while they might not grasp it. They’ll go get somebody else that will sit there and hold their hand, you know. They [IT staff] don’t like to hold your hand that much. They just think you should get it, and not everybody gets it. It takes users three tries and they are right on the page with you. You have to calm them down. Now, it’s about chilling people out, you know, you can do this.

Another frequent comment was that problems caused by the extra work demanded from employees to learn the new system was ignored, as described by this microbiologist:

I: Is there anything that you would like to tell your supervisor anonymously?
R: Probably just that everything went very smoothly. I think for everyone else, they should have had more time away from their every day duties to perform this, instead of having to do both. There were a lot of days when I had to actually do work and find the time to do the programming. That was a little bit intense.

In summary, the training at the hospital was very intensive and laboratory employees in general responded that they had received exposure to many different features of the new systems and appreciated being able to interact with co-workers, in order to learn the new system. Respondents explained their difficulty in trying learning a new system while remaining responsible for completing their full range of normal responsibilities.

**IT transition at the manufacturing facility.** At the manufacturing facility, the current system was a cause of great frustration, and the events related to the implementation of any new system were greeted with enthusiasm. Prevention-focused framing of the pre-transition work situation related to the inadequacy of the old IT. One customer-service employee referred to the old system as “junk” and had the following to say about it: “Whenever other people are referring to the system, it’s never a nice, clean word”. She explained her frustration with her current job, including difficulties with assembling and running reports and tedious re-entry of data as being a “nightmare” and “horrible”, and looks to the new system as an escape from this tedious process. Like other respondents, her prevention focus pertained to reducing losses with the current system and frustrations surrounding related issues such as co-workers and stressful deadlines.

Participation in vendor selection was a positive experience for many of the respondents, and often connected with promotion focus in part because the sessions
introduced expected gains and reassured them of the importance of their
decision-making input. Even though respondents said the early presentations were
especially “dreaded” because they found the presentation style “boring”, the possibilities
found in the new software were still exciting and discussed with anticipation.

There was also concern on the part of the staff about how supervisors would handle
the transition and changing responsibilities. There was a communication problem
between the office staff and the production staff. They expected that these conflicts
would probably carry over into the training and transition to the new system:

R1: The people who do not know how to use computers are going to make this stressful.
There are some who are going to say, ‘I don’t want to do this.’
R2: Some of the supervisors would just rather not be at a computer.

Other respondents wanted to make sure they could practice using a mock system that
was as close as possible to the new system. This respondent expressed her feelings in
this way about that previous frustrating experiences with simulations:

R: They had some test orders and things for us to play with, but to me it was worthless because
they are things we don’t sell and things we don’t do. As soon as we actually got live and were
working with it, things started ticking … Flip the switch and let me work on it, and let it be the
real thing. Don’t let me work in this dummy pretend world, I want to have the real thing there.

There were two main ideas found in the prevention-focused comments related to events
surrounding the upcoming new system. Some respondents expressed fear about their
job security, while other respondents expected that co-workers would be unable to
learn the new system. Job security was especially apropos because a group of current
employees had recently transferred from a nearby plant that had gone out of business.
Fears about changing job responsibilities was also present, but in at least one example
had heard that there were “plans for them”, which was convincing and reassuring. The
training implementation manifested a lack of pre-established structure. The date that
planners set for the system to go live varied throughout the organization. In fact,
respondents explained that their training simply consisted of several one-on-one
meetings with the IT director. In summary, the manufacturing plant employees were
very pleased to get a new system because of the many inadequacies of their old system
and appreciated their involvement in the vendor selection process.

IT transition at the counseling center. Tables III and IV documented counselors’
predominantly prevention-focused framing of events related to the new scheduling
system, which was met with considerable skepticism and anxiety. In general, they
criticized the management’s ability to successfully make the IT transition without
risking loss of control over their schedules.

The respondents noted the intended benefits of having a centralized scheduler, but
expressed lack of trust in management and a concern for the loss of worker privacy.
Prevention-focused comments like these from three different therapists were abundant:

R1: I am actually considerably nervous about what it is going to be like getting the sheets
from the schedule. I don’t want to duplicate everything or have to remember to tell them every
time I make a change. That is adding work. Or I won’t be able to talk sensibly when I am with
a client because the information will be up there at the front desk and not here.
R2: There is a loss of control on the part of the therapist. If there was a way that we could have
some say over whether or not to schedule something, then the system would be an advantage.
R3: I felt this was not going to help my client.
Similarly to the scenario at the manufacturing facility, the transition to the new system at the counseling center was quite unstructured. What differed in this case was that the employees had high levels of anxiety before the change, and even after the system had been in place for several months, they reported relatively few effects – positive or negative – of either the transition process or the new system. The adoption of the new system was announced with a notice in the counselors’ mailboxes. The new system actually resulted in some additional paperwork for the counselors although it did provide some relief from their effort of making the initial contact with clients. Instead of filling out a weekly form to report their schedules, counselors submitted daily reports with changes to the schedule reported separately on another form. In interviews conducted three months after the new system was implemented, this quote was representative of the reactions that counselors had towards the new system:

R: It works fine. The only problem is sometimes I might forget to fill in the form for someone if I get busy after their call and then it gets confusing. It’s kind of a lot of paper though.

Most respondents, like the one quoted below, were a bit surprised to find that the new system had very little effect on their work life:

I: How has it changed your work life?
R: Not a whit. [Laughs]. It makes my life a little easier I guess. I just check things on a form so I like that. It’s better than writing it out. It forces me to be organized, so that’s always good. I am better at doing it this way than I used to be doing it the other way. There are 75% of people who are good at doing paperwork, and I am part of the 25% that is not. I am really not. So anything that’s going to help keep me organized is good.

The following respondent’s concerns reflected the mistrust he and others still had of the administration and the ways in which they might be planning to use the new system against them:

R: I have had that problem in the past with management trying to quantify things too much. They make a justification for wanting to monitor us, and that’s not really a problem in itself, because I know we work hard here. It’s just that (pause), certain, well, the numbers don’t always reflect the reality.

Of the transitions in all three organizations, we can summarize by characterizing the hospital’s implementation as the most structured and organized with the greatest effect on employees’ work lives, the manufacturing facility’s transition as unstructured, and the counseling center’s as both unstructured and producing the most minimal perceived effects on employees’ work lives.

Behavior following the change
The four most frequent examples of approach behaviors were eagerness to learn new procedures (25), helping co-workers (12), doing extra work (seven) and getting involved in the programming and implementation (seven). The most common examples of avoidance behavior were avoiding being trained on or learning the new system (seven), not following IT staffs’ instructions (four), not volunteering to take on extra responsibilities (three), and not reporting others’ counterproductive work behaviors (three). Table VI shows the frequencies of both kinds of behaviors for each organization.
Respondents at the manufacturing organization and the hospital reported about four times as many approach behaviors as avoidance behaviors, whereas respondents at the counseling center reported an equal proportion of both types of behaviors. Given the distributions of promotion focused and prevention focused events summarized in Tables III and IV, the greater proportion of approach behaviors versus avoidance behaviors at the manufacturing facility and the hospital fits consistently with the expectations of our theoretical framework.

Summary of results
We found that our respondents reported 391 distinct emotional events over the course of three waves of interviews. We found the expected internal logical consistency of motivational foci described by regulatory focus theory (RFT) and found distinctive and meaningful patterns of events over time. These events illuminated the features of information technology adoption in organizations: disillusionment with a pre-existing IT system; significant social events relating to planning/selecting the new system; anxieties concerning learning and training; and a variety of occurrences reflecting employees’ acceptance. As RFT would predict, we found evidence of a correspondence between the occurrence of events interpreted in a promotion or prevention focus prior to and during the course of technology transition with the subsequent approach and avoidance behavior associated with adoption of the new technology.

Discussion/conclusions
The primary purpose of this article was to examine the relations between workplace events, emotions, and technology change by using a combination of key features of two theories to frame the change process across three diverse settings. Our synthesis of regulatory focus theory and affective events theory focused on events related to technology and employees’ emotional reactions to those events. Our evidence suggests that employees’ responses to new technology (e.g. resistance to change or rejection of the new system) are necessarily rooted in the emotional experiences surrounding events that lead up to and follow the deployment of the new technology.

The data we presented from three in-depth case studies was analyzed with guidance from our theory synthesis. Using mixed methodologies, we explored the extent to which respondents’ discussions of technology-related change events in their organizations reflected two ideas: first that technology related events evoked emotions, and second that the emotions fit within the bifurcated regulatory focus framework. Our results appear to show promise in this regard. First, we found that respondents readily reported the occurrence of many events related to the selection and deployment of technology within their organizations. Second, after iterative development and improvement of a structured coding scheme we found that we could consistently recognize the emotional content of the primary appraisal as well as

<table>
<thead>
<tr>
<th>Behavior type</th>
<th>Hospital</th>
<th>Manufacturing facility</th>
<th>Counseling center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach</td>
<td>25</td>
<td>38</td>
<td>7</td>
</tr>
<tr>
<td>Avoidance</td>
<td>6</td>
<td>11</td>
<td>7</td>
</tr>
</tbody>
</table>

Table VI. Summary of approach and avoidance behavior
the regulatory focus in employees’ reports of these events. Third, the sequence of
events over the course of the transitions – with its changing focus on the pre-existing
system, training and learning, and the new system – suggested that we had
successfully elicited a set of events with substantial relevance to the technology
transition process. In our effort to understand the role of emotions and events in IT
development, we consider our results a small step in a beneficial direction. Our data showed
that subsequent behavior toward the new technology included both approach and
avoidance behaviors.

Despite these positive points, our data could neither conclusively document the
soundness of our theory synthesis nor provide evidence to its generalizability across
organizational settings or other types of technology. These are expected limitations of
interpretive and case studies. Instead, we suggest that this study offers Type TE
generalizability, as defined in a recent work by Lee and Baskerville (2003), involving
generalizing from theory to empirical statements about what one would expect to
observe. These authors emphasize that TE generalizability does not necessarily mean
that the theory would survive empirical testing in a new setting, as that is not its
intention. Rather, the aim is to move towards being able to use the tested theories in
actual business settings. In our study, we would have preferred to conclude with
statements of what a practitioner might expect to observe and do by applying the
theory. We found, however, that the identification and classification of emotional
statements was an important initial challenge to overcome. Our results are thus only a
first step towards a workable intervention.

With respect to future research, we can reconcile the assertions and structure of the
UTAUT model and other attitude based models with this emotion-based approach in the
following way. We suggest that the beliefs and attitudes that individuals report in
studies that use UTAUT, result from a sequence of completed workplace events
pertaining to the introduction of the new technology and employees’ emotional reactions
to those events. In accord with Weiss and Cropanzano’s (1996) ideas (as well as other
research on attitude formation), events and emotions occur in quick succession while
attitudes are formed and can be elicited at a remove in time of days, weeks, or longer. In
this view, perceived usefulness in the UTAUT model captures the accumulated
interpretation of promotion-focused events surrounding the new technology.

What the regulatory focus perspective also suggests, however, is that avoidance
behaviors toward the technology may arise from a distinct set of influences related to
the experience of negative emotions occurring in a prevention focus. The disruptive or
threatening aspects of new technology introduction may activate purposive behaviors
involving sabotage and other forms of resistance. Although perceived usefulness may
work as an indicator variable that can serve as a sign or predictor of such behavior, we
believe that the separate motivational system related to losses may also imply a
different cognition: perceived threat (cf. Newman and Sabherwal, 1989). Whether it is
possible to distinguish this from perceived usefulness remains to be seen, but the
regulatory focus perspective suggests that it is worth investigating.

The theoretical perspective we described highlights the linkage between the
interpretation of workplace events and an individual’s personal goals. The
introduction of new technology may have implications for goals related to financial
security, career growth, work and family balance, and social relationships at work. The
interpretation of events depends in part upon the individual’s regulatory focus at the
time of the events. A promotion focus will make achievement goals more salient to the individual, while a prevention focus will make security goals more salient. As a result, the strength of an individual's goals may moderate the relationship between perceived usefulness and approach behavior and also between perceived threat and avoidance behavior. Thus, our perspective suggests possible additions and refinement to UTAUT in the choices of moderating variables between attitudes and behavior.

Together, these points suggest a set of tools that managers could use to help monitor and manage actual implementations. First, it would be productive to create an inventory of emotionally significant events surrounding the introduction of new technology in the workplace. Using this inventory of events, and perhaps some normative ratings of their importance or impact, it would be possible to construct a self-report checklist to help ascertain employees' interpretation of these events through their different stages. Obviously it will also be necessary to obtain indications of employees' personal goals, as well as an assessment of trait-like tendencies toward a particular regulatory focus. Finally, a classification of outcome behaviors into categories of approach and avoidance will need to be developed.

The “Technological frames of reference” work of Orlikowski and Gash (1994) as well as Davidson (2006), concerning how organizational members make sense of technology and how it affects planned organizational change, also holds promise for gaining insights into the framing of events in IT transition. In our three cases, both the regulatory focus of individual and the details of organizational events were revealed as important to employees' interpretations of the change. Davidson (2006) suggests that more attention to frames in analysis, increasing emphasis on framing as a dynamic process, and the cultural and institutional characteristics of this process are important future research challenges. For our strategy, frames continue to be important and we think that further development and quantitative assessment of our categorization of events and identification of regulatory focus could contribute. In addition, our results revealed deeper complexity in the timing than we anticipated, which supports Orlikowski and Hofman's (1997) research descriptions of change management as improvisation and quite unpredictable. Employees’ unusual reactions to proposed change often turn out to be more rational than they seemed at first glance when they are viewed within the larger context of mistrust, for example. It takes a combination of methods and inclusion of rich qualitative data to understand the delicate issues within and outside of the frames in question.

These insights may be particularly relevant for practitioners as well, although we caution that efforts to over-manage negative emotion have come to unfortunate conclusions (McGrath, 2006). Not surprisingly, emotional statements among our respondents were a combination of positive and negative, and seemed to fit the emotional charge of the organization as a whole. In the fieldwork phase of this study, employees bubbled over with reports of emotionally charged experiences related to both the old and new technology, including a wide range of social interactions as well as specific experiences related to actual use of the information technology. Practitioners who have the responsibility of ensuring the success of a technology transition may find two aspects of our framework useful. First, our framework suggests a shift in emphasis away from beliefs and towards emotionally relevant events. Second, our framework suggests consideration of two distinct motivational aspects of both new and old technology. Specifically, we believe that one key for
understanding behavior towards an artifact lies in ascertaining whether the individual sees the artifact and the context surrounding its use as a source of gain/growth potential (i.e. promotion-focused) or as a source of loss/insecurity potential (i.e. prevention-focused). An emphasis on emotionally relevant events and attention to the regulatory focus involved in interpretation of those events could provide the basis for some interesting new approaches to organizational interventions. Although it is not the case that prevention-focused motivational orientations are intrinsically problematic, it seems appealing from a humanistic standpoint to emphasize and support development of people’s growth and development needs. We suggest that an intervention should focus on attempting to facilitate situations in which individuals frame relevant transition events with a promotion focus. Taking this as an operating assumption, one might design an intervention process around discovering events that employees currently interpret in a prevention focus, and either trying to diminish the frequency of occurrence of these or shifting employees’ perspectives to a promotion focus through education, training, and/or leadership.

References


Appendix 1

Before we begin, I need to mention a couple of formalities about this interview. I am working with Dr. Jeffrey Stanton at Syracuse University on a project that has been funded by the National Science Foundation. This research has been approved by Syracuse University’s institutional review board and given project number 01123. In this research we are looking at some effects of technology on the workplace and the changes that occur with the introduction of new information systems and practices. We would like to get your perspectives on these issues during this 50-minute interview.

All of your responses will remain confidential. We will aggregate information from many individuals to develop our research conclusions. Neither you personally nor your organization will be identified in any of our research. We will protect your identity in any reports that are provided as feedback to your organization.

With your agreement, we would like to tape record this interview. For this reason we ask that you try to avoid naming specific individuals associated with your organization. Remember that your participation is voluntary and you are free to not answer any question that does not fit your circumstances or that you feel is inappropriate; you may also withdraw from the interview at any time. As you know, I have already obtained approval to ask for your voluntary participation. If you wish to participate, please read and sign the attached informed consent forms. Please keep one signed copy of the form for your records.

**General Questions**

1. What is your position? Can you tell me a bit about what you do here?
2. How long have you been with the organization?
3. How do you feel about your job? What do you like about it? What do you dislike?
4. What are your current responsibilities in your organization?
5. In brief, what is your “workflow” now? (Optional: What kinds of records do you keep? What is the process for keeping these records – timing and so forth?)
6. How do computers (e.g. laptops) fit into this process now?
7. What is troublesome about these tasks? How might these be improved? (Optional: What are the problems you are having right now? What are your expectations about the new system? What other records do you need to access that you cannot conveniently obtain now? How often would you need those data?"

**Changes due to Information Technology**

I'm sure you have heard that your organization is planning to use a new Hospital Information System that will include a new laboratory information system. Now I would like to ask you some questions about these changes.

8. What have you heard about the proposed changes?
9. What are your concerns about the proposed changes?
10. How would a new laboratory information system emotion your relationship with other staff members? (Prompt for separate responses regarding other laboratory staff, nurses, and patients).
11. What benefits can you see of having this new laboratory information system?
13. In terms of a new system for entering orders, how should this be set up differently than now in order to be effective and convenient for you? (Prompt again for entering and tracking results, certifying and verifying results, adding comments).

14. How do you feel about learning the new system? In an ideal world, how would you get your training for the new system?

15. What features or capabilities would the “perfect” system include?

16. What ways do you have, in general, to cope with change that occurs in your department?

17. If you have worked, in another hospital setting, can you talk about how you handled laboratory orders and results differently there?

18. How confident are you that this new system will actually be successful at improving the effectiveness of the lab? (Prompt: We’ve heard that in the past, forecasts were made about new systems and their benefits, and these did not work out as planned. Do you think the present situation is similar?)

19. How do you see the new system increasing or decreasing some of your current job-related stress?

20. How do you see the system affecting your job satisfaction?

21. Based on your experiences in other employment settings, where does the hospital stand in terms of using technology to help staff members do their work more effectively?

Information Boundaries

22. Think about the information that will be stored in the new laboratory information system that we’ve been discussing. What, if any, of this information is sensitive? For example, what kinds of sensitive information will the system have about patients, nurses, doctors, you personally, or about your work activities?

23. In your opinion, how should access to this information be controlled and protected? For example, who should have access to it and what procedures should they have to follow to get access?

24. Do you feel that the planning that is going into this information system and its reported capabilities will be sufficient to deal with your concerns about sensitive information?

Barriers and IT language: User perspective

25. Who are the people here who are directly responsible for information technology (IT) in this organization?

26. How much contact do you have with these people or that person?

27. What is it like working with them? In what ways do you depend on that person’s expertise?

28. What difficulties do you have (if any) understanding what that person is talking about when they discuss IT issues? Does this present a problem for you in doing your job? Why do you think this person talks this way?

29. What is that like for you? How do you think that communication could be improved?
Appendix 2

General Instructions:
Always code the meaning supplied by the respondent’s answer, regardless of whether the respondent was addressing the question or prompt of the interviewer. In other words, if the respondent does not answer the interviewer’s question, the actual answer should guide your coding rather than the question.

1. Always apply a code to a minimum “chunk” of one “I-R” (Interviewer-Respondent) unit. The first line of the interviewer’s question should be the first line of the code and the last line of the respondent’s reply should be the last line of the code.
2. If the same code applies to more than one contiguous I-R chunk, a single code may span multiple chunks. If, however, there is one or more intervening I-R chunks to which the code does not apply, the code should not span these.
3. In cases where a single I-R chunk contains separate utterances with contradictory material, two mutually exclusive codes may be applied to the same I-R chunk.
4. Some I-R chunks may contain no material pertinent to a particular code. In these cases the chunk should be coded with the “neutral” or “null” option provided with each set.

Code Sets
Each of the code sets below provides a group of options from which one code should be selected. Every I-R chunk should be coded with at least one of the members of each set.

Set 2: Primary Appraisal of Events
Affective Events Theory (AET) is a model of emotional experiences in the workplace that construes workplace events (e.g. the announcement of a new technology) as the proximal causes of emotional experience. The theory suggests that people initially think about events as either beneficial or harmful to their personal goals. This initial thinking is called primary appraisal and it captures the initial connection between events and emotion. In this code set, apply the code:

- BENEVENT—When the respondent describes an event, occurrence, or circumstance in this or another work organization. Typically these will be past events, i.e. things that already happened, yesterday, last week, last year, etc. Use this code with events for which the primary appraisal is positive, that is, consistent with the person’s personal goals.
- HARMEVENT—When the respondent describes an event, occurrence, or circumstance in this or another work organization. Typically these will be past events, i.e. things that already happened, yesterday, last week, last year, etc. Use this code with events for which the primary appraisal is negative, that is, inconsistent with the person’s personal goals.
- NONEVENT—When neither BENEVENT nor HARMEVENT applies. This code will apply quite frequently and to a large portion of the text, because many times people describe things in the abstract (“here’s how this usually works), rather than in terms of specific happenings.

Examples (emphasis mine throughout):
BENEVENT:
I: And what was the surprise?
R: With this week? This last one -(unclear)? I dunno, just, they gave a really different presentation. Some of the ones we saw back in July stunk. This one last week was really good.

(Continued)
HARMEVENT:
I: And what kinds of changes have happened?
R: Oh gosh, lots. Our sales manager resigned last Friday and that was big change. (softly) I don’t want to say anything
I: Who, she will be replaced?
R: No, they gave me her job.
I: So how do you handle that?
R: How do I handle that? I’m not happy about it, I mean I wish it wasn’t (unclear), it just if it is handled well – I dunno, I may not be a good one to talk about it.

NONEVENT:
I: Yah? Um, how do you feel about what you do here? What are your responsibilities?
R: Uh, I take down all orders, and “ticking” slips which go with the shipments
I: “Ticking” slips?
R: Yeah, from our system which stinks, right now.
I: Oh really? Could you tell a little bit about that?
R: Uh, It’s awful (laughs), it’s slow – you can’t print any reports, it just, it does nothing, it’s junk. Can’t wait for the new system.

Code Application Guidelines:

<table>
<thead>
<tr>
<th>Type</th>
<th>Apply when response includes</th>
<th>Do not apply when:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENEVENT</td>
<td>Referents: happening, occurrence, event&lt;br&gt;Meanings: The respondent appraises the event as beneficial to his or her personal goals.</td>
<td>The event was clearly seen as a negative thing, or if it difficult for you to say whether the respondent sees it as a positive thing.</td>
</tr>
<tr>
<td>HARMEVENT</td>
<td>Referents: happening, occurrence, event&lt;br&gt;Meanings: The respondent appraises the event as harmful to his or her personal goals.</td>
<td>The event was clearly seen as a positive thing, or if it difficult for you to say whether the respondent sees it as a negative thing.</td>
</tr>
<tr>
<td>NONEVENT</td>
<td>Referents: Processes, procedures, general descriptions of what is, descriptions of how people or situations are.</td>
<td>The respondent refers to a specific historical occurrence in his or her personal history.</td>
</tr>
</tbody>
</table>

Figure A2.

About the authors
Kathryn R. Stam, PhD, is an Assistant Professor of Anthropology and the Coordinator of the Information Design and Technology Master’s at the SUNY Institute of Technology in Utica, New York, where she teaches courses in anthropology, sociology, virtual ethnography and other social and ethical aspects of information technology. Dr. Stam earned her PhD from Syracuse University’s Maxwell School of Citizenship and Public Affairs. She has published a range of qualitative research on the topics of culture and technology and has received financial support
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Jeffrey M. Stanton, PhD is an Associate Professor and the Associate Dean for Research and Doctoral Programs at Syracuse University’s School of Information Studies. Dr Stanton’s educational background and research interests lie at the junction of information technology and organizational behavior. Dr Stanton has published more than 30 journal articles and book chapters on this topic, as well as on organizational research methods, and the measurement of job attitudes. Dr Stanton has received financial support from the National Science Foundation, the Institute for Museum and Library Services, the research foundation of the Society for Industrial and Organizational Psychology, Procter and Gamble, and the National Society of Black Engineers.