The role of monitoring and shirking in information systems project management

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Abstract

Agency theory offers a foundation for explaining the impact of project monitoring on project success. This study applied agency theory to survey 428 information systems project managers concerning their project monitoring, shirking by systems developers, and project success. Greater project monitoring via planning and meetings predicted less shirking, while greater monitoring via responsibilities and comparison did not. Less shirking via poor focus predicted increased project success, while less shirking via loafing did not. These findings have implications for project managers and project management researchers.
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1. Introduction

Completing projects on time, within budget, and with quality is a major challenge facing today's project managers. Project management is a risky endeavor, and too many projects are cancelled before completion while too many others exceed their budgets, are completed beyond their target dates, or lack the expected quality [1]. This problem is especially severe for information systems (IS) projects, perhaps because information technology changes so quickly that new projects are continually using little known technologies and perhaps because information systems providers and users have so much difficulty understanding each other's needs.

Agency theory offers a potential foundation to help explain why projects might be late, beyond budget, and of lower quality [2–4]. The theory asserts that a principle

(typically a manager, and in the current study, an information systems project manager) employs an agent (a subordinate, and in the current study, an information systems developer) to perform work. The theory further states that self-interest motivates the agent to work on tasks of his or her choice. One of the hypothesized relationships in the theory is that the principle monitors the agent to discourage the agent's shirking (i.e., the evading of work, duty, or responsibility) and thereby to encourage the agent to act in the principle's interest. Another is that by acting in the principle's interest, the agent will accomplish the principle's objectives.

The purpose of this paper is to explain the impact of monitoring on project success. It does so by presenting and testing two broad hypotheses. One asserts that greater monitoring results in less shirking. The other asserts that less shirking results in greater project success. By understanding the impact of monitoring, project managers might better use the tool to bring projects more successfully to completion. Fig. 1 shows the original research model; a refined model decomposes the two hypotheses into ten.

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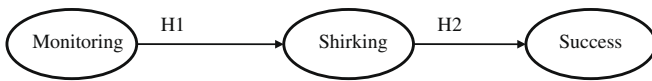   [1] Tel.: +1 859 257 2536; fax: +1 859 257 8031.

Fig. 1. The original research model.

The following two sections define the constructs in the study and then justify the hypotheses. The methodology section describes the data collection and a data analysis section identifies the components of monitoring and shirking. After a refinement of the hypotheses, a section describes the data analysis testing them. The paper concludes with a discussion of the findings and the implications for research and practice.

2. Constructs

2.1. Monitoring

To monitor is to keep track of something systematically in order to collect information about it. Monitoring implies watching, observing, or checking closely or continuously. In project management, the purpose of monitoring is to collect three main classes of information about the progress of a project against a baseline and the anticipated outcome of the project. The classes include information that (1) assures managers that the project is progressing within acceptable budget, schedule, and quality expectations; (2) supports decisions to approve the movement of the project through its stages, and (3) confirms subjective assessments that benefits will be realized [5]. Information about progress against budget, schedule, and quality constitutes feedback about project team members, and can be used to increase their accountability and motivate their behavior to perform more diligently or in some other manner in management's best interest [6,7]. The information can also be used to guide corrective action [8].

Several researchers have empirically tested the impact of monitoring. Using 102 students in a laboratory experiment, increased monitoring was shown to reduce project failure by reducing over-commitment [9]. In another lab experiment with 228 students, monitoring encouraged subordinates to act in the interests of their managers [10]. In a study of 110 boards of director members, monitoring increased actions that saved the organization money [11].

Other researchers have found monitoring effective under specific conditions. A lab experiment found it effective in high-growth environments [12]. In an experiment using 151 undergraduate business majors, less conscientious individuals appeared to increase effort through monitoring whereas conscientious ones did not [13].

On the other hand, some research about the impact of monitoring was inconclusive [14–16]. These inconclusive findings suggest that perhaps monitoring affects performance through a mediator or that some dimensions of monitoring might have an effect while others do not.

In one study, IS project managers described monitoring activities, i.e., how managers monitor IS projects [17]. The

subjects indicated that they monitored by tracking project progress and observing the work of the developers. They named many tools and techniques for doing so. They identified project management software as the most frequently used tool with Microsoft Project as the most popular example. They often named periodic progress reports with comparisons of results to schedules and periodic team meetings as two techniques. Others included a project plan, Gantt charts, and critical path analysis.

2.2. Shirking

Shirking is the evading of work, duty, or responsibility. According to agency theory, such evasion results from the self-interests of the agent in contrast to the interests of the principal [2,3,18]. Nearly every theory of behavior in the social and organizational sciences assumes that individuals act in accordance with their self-interests [19]. Moral reasoning level, however, can have a significant effect on the decision to shirk [20].

Researchers have studied shirking. They have found that individuals with responsibility to share information with their manager shirk by misrepresenting their private information for monetary gain [21,22]. In a lab experiment, subjects with an incentive to shirk tended to make poorer project continuation decisions [23]. Shirking may occur more frequently in a team setting when individual output cannot be precisely measured [24].

Shirking is viewed as deleterious, and it prompts organizations to reward employees based on performance rather than behavior [3]. However, avoidance of work is sometimes deemed beneficial as when workers take periodic breaks to remain fresh [25,26].

Information systems research has shown that an organization with a history of retribution against employees who report bad news provide an incentive to others to shirk by refraining from reporting such news even though doing so would be in the best interest of the organization [27,28]. In one study, national culture - individualistic vs. collectivist (as in the US vs. Singapore) – moderated the effect of organizational climate on the shirking of the responsibility to report bad IS project news [29].

In one study, IS project managers described shirking activities, i.e., developers' activities when not working on their assigned tasks [17]. The managers identified socializing, excessive breaks, surfing the web and playing computer games as the major culprits. Sometimes developers worked on the wrong tasks or reprioritized their assignments so they worked on enjoyable or challenging ones. Disorganization also represented shirking.

3. Project success

Project management is "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements" [30], p. 8. Project management helps organizations develop new products by standardizing and

reducing forgotten tasks. Project management is becoming an increasingly collaborative, information technology-dependent effort [31–33].

Researchers have expressed different interpretations of project success [34], but a project has traditionally been viewed as successful if it was completed on time, within budget, and with quality [35,30]. The time criterion means the completion of the project by an agreed upon date, and the budget criterion means the completion with expenses below an agreed upon maximum. Quality can mean conformance to some predetermined functional and technical criteria, or simply to achieving an acceptable level of user or management satisfaction (i.e., completion with praise and/or little complaint) [36].

A more recent view of project management defines success at project startup as well as throughout the operational life of the project [37]. Consistent with that interpretation, the current study not only considers a project successful if it came in within its original schedule (the time criterion) and its expected cost (the budget criterion), but also if it still works (the quality criterion) after the implementation (i.e., at the time the subjects in the current study responded to a survey about the project).

4. Hypotheses

Haines and Goodhue [38] suggested, as part of a larger framework, that the principle's monitoring of the agent reduces shirking (H1), and that shirking reduces project success (H2). In other words, although the purpose of monitoring in project management is much more than simply to monitor personnel working behaviors, practicing it is expected to affect such behaviors by reducing shirking. Haines and Goodhue made their suggestions based on semi-structured, open-ended interviews with chief information officers and information systems project managers from a dozen different organizations in Europe and the US Agency theory served as the foundation of their reasoning. They described their interviews as "opportunistic, anecdotal evidence that contributed to the generation of the conceptual framework rather than confirmation of the framework [38], p. 30."

H1. The impact of monitoring on shirking.

Monitoring gives the principle the opportunity to observe the behavior of the agent. It enables the principle to discover if the agent is working diligently and exclusively on the assigned tasks. It likewise permits the principle to discover if the agent is working on tasks other than the assigned ones (such as those that serve the agent's self-interest) or if the agent is working less than diligently on those assigned tasks (also potentially a reflection of self-interest).

The agent will fear repercussions from the principle's discovery that he or she is working on other than assigned tasks or working less than diligently on assigned ones [39]. The fear of repercussions from the discovery therefore

motivates the agent to work diligently on the assigned tasks, and thus refrain from shirking [2,40,41].

In the information systems development project context, the project manager would monitor the systems developer's work on, for example, systems analysis, computer programming, or other such development tasks. The systems developer would therefore work more diligently on them.

Thus we hypothesize:

H1. The greater the monitoring, the less the shirking.

H2. The impact of shirking on project success.

Agency theory assumes that shirking will have untoward effects [3]. The agent's failure to work diligently on the principle's tasks would cause the tasks (or at least some of them) to remain unfinished. With tasks unfinished, the entire project would not be completed within the planned time limit. More resources would conceivably be needed to complete the project, and hence the project completion would require greater expenses than budgeted. The scope of the project would conceivably be reduced to remain as close as possible to the time and budget constraints. With the reduced scope, the functional and technical specifications would not be met as well, and user satisfaction would be less. In other words, the quality would suffer.

Conversely, greater diligence on the assigned tasks would increase the chances of finishing them on time, within budget, and with quality, and hence would result in a more successful project.

In the information systems development project context, if the systems developers work diligently on their assigned tasks (i.e., rather than on tasks of their own self-interest), the new computer programs, databases, networks, and procedures would more likely be implemented on time. Current developers might more likely finish the project without needing to work more hours and without needing additional developers. Hence, the budget would more likely be met. More of the components of the new system would be implemented with fewer or even none being dropped or delayed. Thus, the project would provide more of the planned functions and users would be more satisfied with the greater quality.

Hence we hypothesize:

H2. The less the shirking, the greater the project success.

5. Research methodology

5.1. Survey instrument

A review of the literature found very few survey instruments for measuring the monitoring and shirking constructs. Those found were in areas other than information systems and did not adapt well to the IS project context. Therefore, the researchers developed new instruments for measuring them.

The researchers identified 15 companies in a US city to represent a cross-section of company size and industry type [42]. They contacted the companies and asked them to identify an IS project manager to be interviewed. Twelve managers agreed, and the senior author interviewed them face-to-face or by phone. The structured interviews consisted of a series of open-ended questions [43], and lasted an average of 57 min. The interviewer shuffled the order of the questions for each project manager to minimize order bias. The participants ranged from 13 to 28 years of IS experience (with a mean of 21), 9–23 years of project management (with a mean of 14), and up to 420 developers managed (with a mean of 50). Three were from manufacturing, three from health care, and each of the others from a different industry.

The interviewer took extensive notes and later content analyzed them for common phrases and themes [44]. He identified key concepts and compiled them into a pool of sample items for the two constructs [45,46]. The process created 19 detail items for monitoring and 10 for shirking. In addition he drafted 18 more for the former and 4 more for the latter based on a review of the literature. Both authors reworded and refined the items, dropped ambiguous ones, combined duplicate ones, and formatted the resulting ones into a Web-based survey.

Project success, the third construct in the study, was measured using four items. Three items represented the triple constraints of project management [30]. The items assessed the extent that a project had been completed on time and within budget, and still worked at the time of the administration of the survey [37]. The fourth was an overall measure of project success.

5.2. Pilot test

Nine additional project managers from government, education, engineering, telecommunications, consulting firms, financial services, and a restaurant chain iteratively pilot-tested the survey to assess the clarity of its instructions and items, and to test the performance of the Web-based system. They provided feedback, yielding minor formatting and wording changes. The senior author was present for each pilot test. The Appendix shows the final version of the items and instructions in the survey instrument used in this study.

5.3. Data collection

In the first of two phases of data collection, seven Project Management Institute (PMI) chapters granted permission to submit the survey to their IT-industry members. Five of the chapters provided e-mail addresses to the authors, and the other two agreed to e-mail the survey link directly to their IT members. Ten days after the link or survey was e-mailed, reminders were sent. Of the 652 recipients, 208 completed the survey for a response rate of 32%. The authors would use these responses for model refinement.

For confirming the refined model and testing the hypothesis, the authors conducted a second phase of data collection [47]. They asked PMI's Information Systems Specific Interest Group (ISSIG) Director of Professional Development to post the survey to the organization's official website. The director agreed, and advertised the survey to all PMI–ISSIG members with encouragement to those in the IT-industry to complete it. Ten days later, he broadcasted a reminder. This resulted in responses from an additional 222 IT project managers. Two blank surveys were discarded, yielding 220 usable responses. No means of knowing the number of visitors to the site was possible, as is common in such Web surveys [48–50], but comparisons of the responses from the seven chapters with those from the ISSIG found no significant differences (at $p < .05$) in the original 34 independent scaled items (Wilks' $\lambda = .920$, F $= .816$), four dependent scaled items (Wilks' $\lambda = .972$, F $= 2.628$), five project characteristics (Wilks' $\lambda = .979$, F $= 1.330$), and seven personal/organizational characteristics (Wilks' $\lambda = .969$, F $= .979$).

The project managers had been with their current employers for about 8 years and had been in the IT field for about 13 years. They had an average of four direct reports and 15 indirect reports. The median number of IT professionals in their organization was 300, with a median of 4350 total employees. The median annual gross revenue of the organizations was about $1 billion. The projects ranged in initial budget from $30,000 to $60 M, and from 1 month to 5 years, with an average of 24 developers.

All 428 project managers were invited to participate in a drawing for one of three $100 gift certificates at the PMI Bookstore. The 273 acceptors identified themselves with their e-mail addresses, and received a follow-up message asking them to forward a link to a participant from the project team. This link pointed to a survey containing only the project success items and a few demographic questions. Sixty-five team participants returned these secondary surveys (37 from the seven chapters and 28 from the ISSIG) for a 24% response rate.

5.4. Data analysis

The data analysis followed the approach recommended by Bentler [51], Chin [52], and Hatcher [53]. It began with tests for nonresponse bias and common method variance. The constructs were refined using exploratory factor analysis (EFA) on the data collected from the 208 project managers from the initial seven chapters, and then employed in validation and hypothesis testing using Partial Least Squares (PLS) with the data collected from the 220 ISSIG project managers.

5.5. Nonresponse bias

Late respondents were used as surrogates for nonrespondents to test for nonresponse bias [54]. A Wilks'

lambda comparing early respondents to late respondents (i.e., those after the reminder mailing) did not identify differences ($\lambda = .877$, F = 1.072) [55], a result consistent with the absence of nonresponse bias.

5.6. Common method variance

Harman's single-factor test was used to check for common method variance [56,57]. Common method variance (i.e., in the current study, the use of a single subject for assessing each construct) is a problem that can show, at least in part, a relationship between similar measures [58]. Harman's test assumes that if a substantial amount of such variance is present in the data, then a single factor that accounts for most of the variance will emerge from an EFA of all the variables. The test has found usage in information systems research [59,60]. The analysis in the current study revealed 6 factors with an Eigenvalue greater than one, and no single factor explained most of the variance (i.e., the percentages explained ranged from 1.3% to 27.4%). These results are consistent with the absence of significant common method variance.

Paired t-tests compared the four success items of the 65 secondary team participants with the analogous items from their corresponding project managers. None of the paired t-tests were significant at the p < .05 level, another finding consistent with the absence of common method variance.

5.7. Exploratory factor analysis

EFA on the data collected from the seven chapters with SPSS using maximum likelihood extraction with Varimax rotation and the eigenvalue-one rule was applied to identify the underlying dimensions of the monitoring and the shirking constructs. Items were dropped if they had loadings below 0.40, loaded on more than one factor, or did not fit theoretically. (Factor loadings will appear in a table in the next section where the factor structure is confirmed on the second set of data.)

Monitoring had four dimensions (planning, responsibility, comparison, and meetings) of 4, 3, 2, and 2 items respectively with alphas of .75, .72, .80 and .77. The planning dimensions included having a project plan, analyzing major risk factors, employing critical path analysis, and using Gantt charts. Responsibilities included project manager sign-off on deliverables as completed, user sign-off on deliverables as completed, and structured walkthroughs. Comparison included periodic comparison of actual results to planned results as well as periodic comparison of actual costs to estimated costs. Meetings included periodic project review sessions and team meetings.

Shirking had factors of loafing with 6 items (and alpha of .90) and poor focus with 4 (and alpha of .83). Loafing included playing computer games, sending e-mail jokes, socializing, surfing the Internet, taking excessive breaks, and taking long lunches. Poor focus included being poorly

organized; spending time on tasks other than their assigned duties; working on enjoyable, less important tasks; and working on the wrong tasks.

An EFA for the already theoretically-grounded, four-item project success construct was not run, but its alpha was calculated (.82). All of the alphas thus exceeded the conventional cutoff of .70 [61].

6. Model refinement

The EFA permitted the refinement of the original model so that the two hypotheses could be decomposed into ten.

6.1. The impact of monitoring on shirking

The original H1 had proposed that more monitoring leads to less shirking. With four dimensions of monitoring (i.e., planning, responsibilities, comparison, and meetings), and two dimensions of shirking (loafing and poor focus), combinations could enable exploring multiple relationships.

For example, greater monitoring via the planning dimension facilitates a project plan to enable more organized monitoring and hence better observation. Better observation permits the principle to better detect the playing or socializing that constitute the loafing dimension and thus more effectively discourage the agent from it for fear of repercussion. Better observation also permits the principle to better detect the disorganization that constitutes the poor focus dimension, and thus more effectively discourages the agent from it. Hence we hypothesize:

H1a. The greater the monitoring via planning, the less loafing.

H1b. The greater the monitoring via planning, the less poor focus.

Greater monitoring via the responsibilities dimension facilitates signoffs that more strongly commit the agent to the project priorities. Such stronger commitment thus discourages the agent from the playing or socializing that constitutes the loafing dimension as well as from the disorganization of the poor focus dimension. Hence:

H1c. The greater the monitoring via responsibilities, the less loafing.

H1d. The greater the monitoring via responsibilities, the less poor focus.

Greater monitoring via the comparison dimension facilitates better contrasting of and thus better knowledge of actual versus planned progress. The agent's awareness of that better knowledge discourages the agent from the activities of the loafing and poor focus dimensions because the activities cause greater variance of actual versus planned and hence greater threat to the agent of repercussion. Hence:

H1e. The greater the monitoring via comparison, the less loafing.

H1f. The greater the monitoring via comparison, the less poor focus.

Greater monitoring via the meetings dimension facilitates the principle's better knowledge of project status and the agent's accomplishments. The knowledge discourages the agent from the activities of the loafing and poor focus dimensions because the activities cause project delay and the principle's knowledge makes for a greater threat to the agent of repercussion. Hence:

H1g. The greater the monitoring via meetings, the less loafing.

H1h. The greater the monitoring via meetings, the less poor focus.

Less of the playing or socializing of the loafing dimension would enable the agent to work more diligently and more likely complete the project on time, within budget and with quality. Hence:

H2a. The less loafing, the greater the project success.

Less of the disorganization of the poor focus dimension would enable the agent to work more effectively and efficiently, and more likely complete the project on time, within budget and with quality. Hence:

H2b. The less poor focus, the greater the project success.

Fig. 2 shows the refined model. It decomposes the two original hypotheses into ten.

6.2. Validation and hypothesis testing

The second phase of data collection used the survey responses from the ISSIG project managers to validate the constructs and to test the hypotheses. It employed Partial Least Squares (PLS) Graph version 3.0, a structural equation modeling tool that uses a least squares estimation procedure [52,62]. Using PLS, a bootstrap re-sampling procedure can be employed. PLS permits constructs of reflective and formative indicators, but all constructs were reflective in this study.

PLS was used to examine internal consistency reliability (ICR), convergent validity, and discriminant validity (Chin 1998). The ICR values, which resemble Cronbach's alpha, all met the criterion of .70 [63].

Two criteria were used to test for convergent and discriminant validity. All square roots of the average variances extracted (AVE) were at least .707 (i.e., AVE > .50) and exceeded the construct's correlation with other constructs [52,63]. The standardized item loadings generally exceeded .707 (i.e., all but one did so), and all items loaded more highly on their own constructs than on others [64].

Table 1 shows the factor loadings and cross loadings, and Table 2 shows the ICR values, the square roots of the AVEs, and the correlations between constructs. Thus, the analysis supports the reliability, and the convergent and discriminant validity of the constructs in the model. Table 3 shows the means and standard deviations for all of the items and their constructs.

6.3. Test of hypotheses with findings

The results of the hypotheses testing appear in Table 4. The analysis supported the effect of monitoring via planning on loafing ($p < .01$) and poor focus ($p < .05$), and of meetings on loafing ($p < .05$) and poor focus ($p < .001$). It also supported the effect of poor focus on project success ($p < .001$).
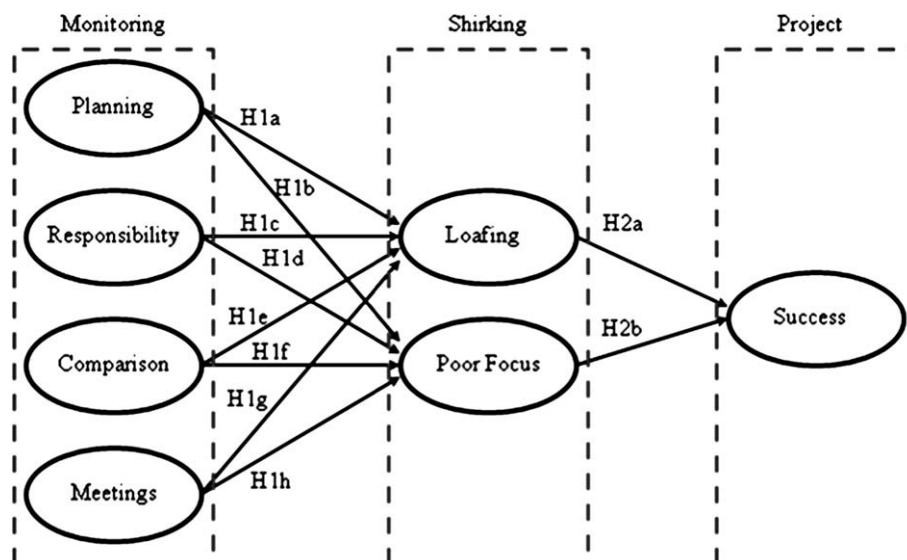

Fig. 2. The refined research model.

Table 1
Factor loadings.

Constructs/item #	Items	Planning	Responsibilities	Comparison	Meetings	Loafing	Poor focus	Success
Planning								
MON01	A project plan	**.83**	.48	.59	.37	−.31	−.25	.39
MON02	Analysis of major risk factors	**.75**	.41	.47	.38	−.24	−.23	.40
MON03	Critical path analysis	**.81**	.46	.43	.29	−.25	−.33	.34
MON04	Gantt charts	**.59**	.35	.41	.24	−.13	−.16	.24
Responsibilities								
MON15	Project manager sign-off on deliverables as completed	.44	**.82**	.35	.37	−.16	−.18	.33
MON21	User sign-off on deliverables as completed	.47	**.80**	.37	.33	−.15	−.16	.42
MON18	Structured walkthroughs	.46	**.79**	.30	.34	−.18	−.20	.32
Comparison								
MON08	Periodic comparison of actual results to planned results	.61	.38	**.93**	.40	−.22	−.27	.43
MON07	Periodic comparison of actual costs to estimated costs	.54	.40	**.90**	.31	−.22	−.21	.39
Meetings								
MON11	Periodic project review sessions	.43	.46	.39	**.95**	−.32	−.38	.35
MON12	Periodic project team meetings	.31	.30	.28	**.84**	−.15	−.25	.28
Loafing								
SHIRK04	Playing computer games	−.18	−.13	−.17	−.23	**.79**	.42	−.17
SHIRK06	Sending e-mail jokes	−.26	−.12	−.17	−.23	**.85**	.51	−.17
SHIRK07	Socializing	−.25	−.15	−.12	−.23	**.75**	.58	−.20
SHIRK09	Surfing the Internet	−.35	−.25	−.27	−.34	**.85**	.49	−.21
SHIRK10	Taking excessive breaks	−.26	−.19	−.23	−.21	**.86**	.54	−.18
SHIRK11	Taking long lunches	−.22	−.14	−.17	−.08	**.77**	.51	−.20
Poor focus								
SHIRK01	Being poorly organized	−.34	−.19	−.26	−.30	.35	**.75**	−.28
SHIRK08	Spending time on tasks other than their assigned duties	−.23	−.21	−.15	−.31	.62	**.82**	−.31
SHIRK13	Working on enjoyable, less important tasks	−.22	−.13	−.21	−.27	.61	**.81**	−.37
SHIRK14	Working on the wrong tasks	−.28	−.21	−.23	−.30	.46	**.86**	−.35
Project success								
S01	The project came in within its original schedule	.38	.32	.35	.28	−.15	−.32	**.83**
S02	The project came in within its original budget	.32	.31	.37	.26	−.17	−.30	**.81**
S03	The project that has been developed works	.35	.35	.38	.27	−.24	−.29	**.77**
S04	Overall, to what extent do you agree the project was successful?	.44	.45	.37	.35	−.21	−.38	**.86**

Table 2
Reliabilities, convergent validities, and discriminant validities.

	ICR	Planning	Responsibility	Comparison	Meetings	Loafing	Poor focus	Success
Planning	.84	***.75***						
Responsibility	.84	.57	***.80***					
Comparison	.91	.63	.42	***.92***				
Meetings	.89	.42	.44	.39	***.90***			
Loafing	.92	−.32	−.21	−.24	−.28	***.81***		
Poor focus	.89	−.33	−.23	−.26	−.36	.62	***.81***	
Success	.89	.46	.44	.45	.36	−.23	−.40	***.82***

Note: Average variance extracted square roots appear on the diagonal in bold, italic, and correlations appear below them.

7. Discussion

The analysis supported the effect of monitoring via planning (H1a and H1b) and via meetings (H1g and H1h) on loafing and poor focus. It failed to support the effect of monitoring via responsibilities (H1c and H1d) or via comparison (H1e and H1f) on loafing and poor focus. Interestingly, these findings and lack of findings pointed to a pattern showing that monitoring by planning and meetings was effective for both shirking dimensions whereas moni-

Table 3
Means and standard deviations for constructs and items.

Constructs/item #	Items	Mean	SD
Planning		**3.43**	**1.28**
MON01	A project plan	4.19	1.02
MON02	Analysis of major risk factors	3.19	1.22
MON03	Critical path analysis	2.89	1.18
MON04	Gantt charts	3.44	1.31
Responsibilities		**3.42**	**1.36**
MON15	Project manager sign-off on deliverables as completed	3.37	1.42
MON21	User sign-off on deliverables as completed	3.79	1.29
MON18	Structured walkthroughs	3.10	1.28
Comparisons		**3.49**	**1.34**
MON08	Periodic comparison of actual results to planned results	3.70	1.23
MON07	Periodic comparison of actual costs to estimated costs	3.29	1.42
Meetings		**4.28**	**0.92**
MON11	Periodic project review sessions	4.17	1.00
MON12	Periodic project team meetings	4.39	0.82
Loafing		**1.74**	**0.97**
SHIRK04	Playing computer games	1.35	0.78
SHIRK06	Sending e-mail jokes	1.66	0.94
SHIRK07	Socializing	2.26	0.96
SHIRK09	Surfing the Internet	1.86	1.06
SHIRK10	Taking excessive breaks	1.64	0.89
SHIRK11	Taking long lunches	1.68	0.91
Poor focus		**2.29**	**1.06**
SHIRK01	Being poorly organized	2.49	1.03
SHIRK08	Spending time on tasks other than their assigned duties	2.40	1.06
SHIRK13	Working on enjoyable, less important tasks	2.10	1.04
SHIRK14	Working on the wrong tasks	2.15	1.09
Success		**3.62**	**1.32**
S01	The project came in within its original schedule	3.21	1.42
S02	The project came in within its original budget	3.15	1.49
S03	The project that has been developed works	4.24	0.96
S04	Overall, to what extent do you agree the project was successful?	3.86	0.99

Table 4
Hypothesis testing.

Hypotheses	Independent variable	Dependent variable	Path	*T*-value	*p*
	Monitoring via:	*Shirking via:*			
H1a	Planning	Loafing	−.25	2.68	.01
H1b	Planning	Poor focus	−.22	2.04	.05
H1c	Responsibilities	Loafing	.01	.25	ns
H1d	Responsibilities	Poor focus	.01	.27	ns
H1e	Comparison	Loafing	−.03	.23	ns
H1f	Comparison	Poor focus	−.03	.33	ns
H1g	Meetings	Loafing	−.19	2.08	.05
H1h	Meetings	Poor focus	−.27	3.21	.001
	Shirking via:	*Project:*			
H2a	Loafing	Success	.01	.35	ns
H2b	Poor focus	Success	−.43	5.20	.001

toring by responsibilities and comparison was ineffective for both.

Support for H1a and H1b is consistent with the expectation that greater monitoring via the planning dimension facilitates a project plan to enable more organized monitoring, better observation, better detection of loafing and poor focus, and hence discouragement of them for fear of repercussion. Support for H1g and H1h is consistent with the

expectation that greater monitoring via the meetings dimension facilitates the principle's better knowledge of project status and the agent's accomplishments, and that such knowledge discourages the agent from the activities of loafing and poor focus.

Perhaps the study failed to find support for H1c and H1d (the effect of monitoring via responsibilities on loafing and poor focus) because, we speculate, developers do not

take signoffs seriously. Perhaps they witness so many projects exceeding targeted completion dates and budgets without repercussions for developers that they realize that they are not bound to their signoffs. There will be, they anticipate, no repercussions.

Perhaps the study failed to find support for H1e and H1f (the effect of monitoring via comparisons on loafing and on poor focus), because, we speculate, that developers feel that targeted completion dates and budgets are so unrealistic that comparing accomplishments to them is meaningless. Again, they expect no repercussions, but in this instance, for failure to meet the targets.

The analysis provided support for H2b (the effect of poor focus on project success). This was consistent with the expectation that being better organized during project execution would enable the agent to work more effectively and efficiently, and more likely complete the project on time, within budget and with quality.

The analysis, however, failed to support H2a (the effect of loafing on project success). This finding was not consistent with the expectation that less of the playing or socializing would enable the agent to work more diligently and more likely complete the project on time, within budget and with quality. Perhaps, we speculate, some playing or socializing is beneficial (albeit unapproved by management) and enables developers to refresh and recommit to their work. Perhaps some such socializing improves communication among team members, and this improved communication enables better transfer of knowledge about the project. Perhaps a very great deal of loafing would reduce project success, but this study did not detect such a level.

8. Implications for researchers

Agency theory predicts that monitoring decreases shirking, and decreased shirking leads to project success. By decomposing monitoring and shirking, this study found that monitoring by planning and meetings predicted shirking via loafing and poor focus, but that monitoring via responsibilities and comparison did not. It further found that poor focus predicted less project success while loafing had no effect on success.

The failure to find that monitoring reduces shirking in certain cases (H1c, H1d, H1e, H1f) and the failure to find that shirking predicts project failure in certain cases (H2a) suggest that agency theory is not always applicable. The findings do not identify a specific new theory, but do indicate the need to better understand and qualify the existing one.

We speculate about reasons that monitoring via responsibilities and comparison had no effect on shirking. We propose, that is, that developers view target dates as unrealistic and that repercussions for missing them are minimal. Future researchers can interview or survey developers to either confirm such speculation, refute it, or discover other reasons for the absence of the effect of monitoring on shirking.

Future researchers might also seek ways to enable responsibilities and comparison to have an effect on shirking. If our speculation is correct, then perhaps more realistic target dates or repercussions for missing them (or rewards for achieving them) might cause developers to take monitoring via responsibilities and comparison more seriously, might thus reduce poor focus, and thereby bring about project success.

We speculate that loafing does not predict reduced project success because loafing is not extensive. We speculate, in other words, that IS developers generally work diligently. Future researchers might thus investigate the prevalence of loafing. They might, for example, attempt to assess the amount of time actually lost due to it. Although agency theory predicts shirking to be problematic, and the current study found loafing to be a dimension of it, a literature review by the authors found very little research into either shirking or loafing. If loafing is not prevalent and does not reduce project success, then it is seemingly not a pressing or even worthy target for research.

However, poor focus did predict less project success. Hence future researchers might investigate ways to prevent developers from being poorly organized, spending time on tasks other than their assigned duties, working on enjoyable but less important tasks, and working on the wrong tasks.

The current study found that monitoring via planning and meetings is effective at reducing shirking, and in particular, poor focus. Because planning and meetings are time consuming, future researchers might investigate more efficient means of using plans and conducting meetings.

The current study investigated the effects of monitoring and shirking on information systems development projects in a wide range of industries and project sizes and types. Future researchers might investigate the constructs not only in IS projects in specific industries, project types, and sizes, but also in non-information systems projects such as those in construction and other industries.

The current study collected data from project managers. Future researchers might investigate the perceptions of other project participants, end users, and even top managers because their views might elucidate the relationships. Perhaps systems developers view monitoring, shirking, and their effects quite differently than do such other stakeholders.

Finally, agency theory served as the foundation for the current study. Although widely used and respected, the theory does limit the variables. Future researchers might investigate other potential mediators of the effect of monitoring on project success besides shirking. Although not components of agency theory, top management support, user involvement, the use of corrective action, and the identification of risks may be examples of other possible mediators.

9. Implications for IS project managers

This research found monitoring composed of four dimensions: planning, responsibilities, comparisons, and meetings. IS project managers might use those dimensions and the items within them (see Table 3) as checklists to help them assess their own monitoring and whether they conduct it as they would like. In other words, they can question whether they should change the extent and manner in which they employ a project plan, the analysis of major risk factors, critical path analysis, Gantt charts, and the other tools and techniques from Table 3.

The research found shirking composed of two dimensions: loafing and poor focus. IS project managers might similarly use those dimensions and their items to help them assess shirking in their own organizations. In other words, they might investigate the extent employees participate in playing computer games, sending e-mail jokes, socializing, surfing the Internet, taking excessive breaks, or taking long lunches, and the effects of such activities. Likewise they might investigate the extent that employees are poorly organized, spend time on tasks other than their assigned duties, work on enjoyable but less important tasks, or work on the wrong tasks.

This research suggested that monitoring via planning and meetings inspires information systems developers to refrain from loafing and poor focus. On that basis, IS project managers might more extensively emphasize monitoring through a project plan, analysis of major risk factors, critical path analysis, and Gantt charts and more extensively emphasize meetings through periodic project review sessions and formal team gatherings to accomplish such objectives."

The research suggested that monitoring via responsibilities and comparisons fails to inspire developers to refrain from loafing and poor focus. On that basis, project managers might de-emphasize their use of such monitoring to accomplish those objectives, or might look for ways to more effectively monitor."

Although monitoring via planning and meetings predicts less loafing, less loafing does not predict more project success. Hence, project managers might feel less need for apprehension about loafing.

10. Conclusion

This paper examined the effect of monitoring on shirking, and the effect of shirking on information systems project success in the holistic context of both project implementation and ongoing use [37]. It contributed by finding monitoring to be a four dimension construct and shirking to be of two dimensions. It found that monitoring via planning and meetings appears to reduce shirking (for both poor focus and loafing), but fails to do so via responsibilities and comparison (again for both poor focus and loafing); in other words, it warns that diligent monitoring of task completions may fail to focus developers on the

essential tasks and may fail to discourage them from slacking off. It found that shirking via poor focus predicts project failure whereas shirking via loafing does not; in other words it warns that effort on the wrong tasks may doom a project even if the effort is diligent. Such findings provide a basis for project managers to improve the successfulness of their projects by better use of monitoring to encourage developers to focus on the most appropriate tasks, and for researchers to further investigate and enhance our understanding of project management by studying such management using broader and more diverse approaches.

Appendix: Survey items and instructions

Project monitoring

To what extent did your organization use the following tools, techniques, or practices to monitor the most recently completed large IS project? (Participants answered on a 1–5 scale where 1 meant to a very little extent and 5 meant to a very great extent.)

– A project plan.
– Analysis of major risk factors.
– Critical path analysis.
– Gantt charts.
– Internal posting of project progress for all developers' review.
– Periodic audit by external auditors.
– Periodic comparison of actual costs to estimated costs.
– Periodic comparison of actual results to planned results.
– Periodic comparison of project progress to schedule.
– Periodic computation of the percentage completed.
– Periodic project review sessions.
– Periodic project team meetings.
– Post-completion audit of the project.
– Project management software.
– Project manager sign-off on deliverables as completed.
– Project progress reports.
– Software change management.
– Structured walkthroughs.
– Time reports periodically produced by developers.
– Testing of modules by project manager for completeness.
– User sign-off on deliverables as completed.
– Overall, to what extent was the project monitored?

Task focus

Developers are typically well focused on the essential tasks of a project. However, occasionally they waste time on inappropriate tasks. To what extent did developers waste time on the following tasks on the most recently completed large IS project? (Participants answered on a 1–5 scale where 1 meant to a very little extent and 5 meant to a very great extent.)

– Being poorly organized.
– Calling in sick when healthy.
– Claiming not to understand the requirements.
– Playing computer games.
– Reading a newspaper.
– Sending e-mail jokes.
– Socializing.
– Spending time on tasks other than their assigned duties.
– Surfing the Internet.
– Taking excessive breaks.
– Taking long lunches.
– Talking on the phone.
– Working on enjoyable, less important tasks.
– Working on the wrong tasks.
– Overall, to what extent did developers waste time on inappropriate tasks?

Project evaluation

To what extent do you agree with the following statements? (Participants answered on a 1–5 scale where 1 meant strongly disagrees and 5 meant strongly agree.)

– The project came in within its original schedule.
– The project came in within its original budget.
– The project that has been developed works.
– Overall, to what extent do you agree the project was successful?

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