

# RESPONDING—OR NOT—TO INFORMATION TECHNOLOGY PROJECT RISKS: AN INTEGRATIVE MODEL

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# **Appendix A**

# Phase 1: Risk Response Selection Instrument and Results I

To select risk responses matching the desired profile, we designed and ran a survey with ITPMs and IT project management academic experts (Table A1). The survey presented the respondents with the specific risk responses (SRRs) from Table 1 and asked them to rate each SRR on the three profile dimensions on a scale of low, medium, and high.

For each SRR, the percentages of the responses that matched the desired value of each dimension of the profile were calculated. For example, for the first SRR (having user representatives), 71% of the ratings matched the ideal profile of low or medium frequency of practice. Then, the Euclidean distance of each risk response from the ideal profile (representing how well the risk response matches the entire profile) was calculated using the formula

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Euclidean Distance<sup>2</sup> = (100\% - percent of responses rating importance as Med/High)^2 + (100\% - percent of responses rating control as Med/High)^2 + (100\% - percent of responses rating frequency as Low/Med)^2
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A one-sample t-test was used to verify whether the calculated distance for each SRR was different from the mean distance of all SRRs. Table A2 presents the results. The mean Euclidean distance from the ideal profile was 0.321 (SD = 0.631) over 19 SRRs. For each risk response category, the SRR with the minimum Euclidean distance was selected for further examination (formatted as bold in the table). As the p-values indicate, the distance for each selected SRR was significantly different from the mean distance over all SRRs.

# Table A1. The SRR Selection Questionnaire

# Instructions

We are interested in three aspects of IT project management activities. These aspects are:

- 1: Importance for Managing Risk: How important is doing the activity for responding to the risks in IT projects?
- 2: Extent of Control: To what extent doing the activity is under the control of a typical IT project manager?
- 3: Frequency Practiced: How common is doing the activity in the IT projects you have seen so far?

Please think of IT development/implementation projects you have seen in the past. Then, rate each of the IT project management activities listed below along the three mentioned aspects.

Project Management Activity	1: Importance for Managing Risk?	2: Extent of ITPM's Control?	3: Frequency Practiced?
Making users responsible to do a part of the project.	L - M - H	L - M - H	L - M - H
Having end-user representatives as project team members.	L - M - H	L - M - H	L - M - H
Getting users' formal approval on the work done.	L - M - H	L - M - H	L - M - H
Staffing project team with appropriate expertise.	L - M - H	L - M - H	L - M - H
Putting every effort to reduce team member turnover.	L - M - H	L - M - H	L - M - H
Appreciating team members' work in a tangible way during the project.	L - M - H	L - M - H	L - M - H
Putting every effort to coordinate project team members' work.	L - M - H	L - M - H	L - M - H
Keeping project members informed about major decisions.	L - M - H	L - M - H	L - M - H
Drawing up a formal agreement of work to be done.	L - M - H	L - M - H	L - M - H
Scope freeze (no longer accepting changes in the features and functionalities).	L - M - H	L - M - H	L - M - H
Incremental development.	L - M - H	L - M - H	L - M - H
Prototyping.	L - M - H	L - M - H	L - M - H
Comprehensive testing before going live.	L - M - H	L - M - H	L - M - H
Pilot testing.	L - M - H	L - M - H	L - M - H
Using tools such as PERT or CPM to closely follow the project's status.	L - M - H	L - M - H	L - M - H
Paying special attention to project planning.	L - M - H	L - M - H	L - M - H
Allocating significant resources to estimate project times and budgets.	L - M - H	L - M - H	L - M - H
Following an appropriate project management methodology.	L - M - H	L - M - H	L - M - H
Getting top management support of the project.	L - M - H	L - M - H	L - M - H

Table A2. R	isk Response Selection Results					
		Importance	Control	Frequency		<i>p</i> -value (Difference
Category	Specific Risk Response	Med-High	Med- High	Low-Med	Euclidean Distance	from Mean Distance)
	Having end-user representatives as project team members.	100%	76%	71%	0.374	0.002
External Integration	Getting users' formal approval on the work done.	93%	86%	64%	0.389	0.000
	Making users responsible to do a part of the project.	90%	66%	75%	0.438	0.000
	Appreciating team members' work in a tangible way during the project.	79%	97%	89%	0.236	0.000
Internal	Keeping project members informed about major decisions.	93%	100%	71%	0.294	0.074
Integration	Putting every effort to coordinate project team members' work.	97%	97%	64%	0.360	0.015
	Staffing project team with appropriate expertise.	100%	72%	75%	0.372	0.002
	Putting every effort to reduce team member turnover.	97%	59%	93%	0.421	0.000
	Dedicating much effort to project planning.	97%	100%	78%	0.225	0.000
	Drawing up a formal agreement of work to be done.	86%	100%	81%	0.234	0.000
	Pilot testing.	100%	79%	86%	0.258	0.000
	Incremental development.	93%	83%	82%	0.258	0.000
	Using tools such as PERT or CPM to closely follow the project's status.	76%	100%	85%	0.283	0.017
Formal Planning	Following an appropriate project management methodology.	93%	97%	71%	0.296	0.096
	Scope freeze	90%	72%	93%	0.303	0.224
	Allocating significant resources to estimate project times and budgets.	93%	72%	89%	0.304	0.242
	Getting top management support of the project.	100%	76%	79%	0.323	0.926
	Prototyping.	93%	75%	74%	0.367	0.005
	Comprehensive testing before going live.	100%	90%	64%	0.372	0.003

# **Appendix B**

# Phase 2: Belief Elicitation Instrument and Detailed Results

This study considers the EDE and ESE dimensions of ORRA, PP, and PC to have underlying belief composites. As the beliefs pertain to the specific risk responses (SRRs) studied, they were created using a belief elicitation procedure (Fishbein and Ajzen 2010), using a semi-structured interview guide. Data analysis intended to identify the *modal* salient attitudinal, pressure, and control beliefs of ITPMs. While salient beliefs are held by one person, *modal* salient beliefs are shared by different people, here by at least 20% of the respondents (see Fishbein and Ajzen 2010, p. 103). Responses were analyzed via open, axial, and selective coding (Strauss and Corbin 1990) in NVivo 10. Table B1 presents examples of the interview text and the open, axial (belief statements), and selective codes (theoretical constructs informed by TPB) for SRR1. Data collection and coding continued until saturation was reached. This effort resulted in conducting 15 interviews for SRR1, 16 for SRR2, and 12 for SRR3 with a total of 24 ITPMs. One coder performed the coding, and a second coder verified 10% of the open codes and all axial/selected codes (belief statements). The same PP beliefs were used for all SRRS. The few disagreements—on the wording of the belief statements—were discussed until resolved. Table B2 presents the final belief statements.

Table B1. Coding Examples					
Interview Text	Open Code	Axial Code (Bold)	Selective Code (Core Concept Informed by TPB)		
<b>PM01</b> it will create support in the organization, when they [end users] are themselves involved.	Creating end-user support				
<b>PM03</b> if you establish a good relationship with that person, or them if there is more than one, usually they can talk to the sponsor before you present the sponsorSo they can do internal damage control on their side before we announce either a bad news or a good news about something that the sponsor needs to approve.	Preparing end-users for good or bad news	Having user representatives as project team members prevents end-user	Expected Desired Effects		
PM05 if the feeling of the person is thatthey will not use the system, they will block, they can badmouth the project. [Having user reps is] giving direction in term of what needs to be done to make sure we are minimizing the impact on users, by doing the right change management activities, etc.	Preventing end-users from not using, blocking, and bad mouthing the system	resistance.			
<b>PM01</b> it's some sort of feeling that we are wasting time, that probably they insist on doing something groundless that probably will not be useful in the future.	Wasting time on developing extra functionalities	Having user representatives as			
<b>PM02</b> when we were doing the testing with the customer [i.e., the user rep], the customer kept saying this is not what I wanted; this is not what we asked for, this is not in the requirements.	Continued criticism of the functionalities	project team members permits end-users waste project time on attempts to perfect	Expected Side Effects		
<b>PM04</b> [Without user reps,] The project will be much faster. Because we won't get all of the roadblock related to looking for perfection looking for all of the answers.	Attempting to perfect the system	system functionalities.			
<b>PM01</b> Then there was a member of the board of directorsHe said that you should get the requirements from this person [user rep].	A member of the board of directors	The sources of pressure for/against			
<b>PM02</b> At first, my program manager was worried [that the user reps] are gonna change the requirements, without us really doing change management.	Program Manager	having user representatives as project team members	Perceived Pressures		
PM04 It's one representative pushed by the directing committee, [they said:] this is you resource.	Directing Committee	include <b>upper</b> <b>management.</b>			
PM01 That such a person with both technical knowledge and domain knowledge is available.	Some relevant knowledge (IT, domain)	Having user representatives as			
<b>PM06</b> Well, if you had a user rep who didn't understand the limitation of technology, then it'd become really hard [as some of the] things they askaren't possible no matter how much effort you put in.	Some relevant knowledge (limitations of IT)	project team members is facilitated by having user representatives with some knowledge of IT (its capabilities	Perceived Control		
<b>PM07</b> If there were people that were knowledgeable about projects, about IT developmentthen it would be all easy.	Some relevant knowledge (IT, projects)	and limitations) and projects.			

Table B	2. The Elicited Modal Salient Beliefs	
	SRR1	
	Having user representatives as project team members	Freq.
	prevents end-user resistance	60.0% (9 of 15)
	prevents delivering a system with wrong functionalities	60.0% (9 of 15)
ORRA - EDE	prevents producing a not-user-friendly system interface	40.0% (6 of 15)
	prevents project team wasting time deciding about system functionalities	33.3% (5 of 15)
	prevents failure in communicating with the end-user community	33.3% (5 of 15)
	prevents forgetting to address some user requirements	26.7% (4 of 15)
	Having user representatives as project team members	Freq.
	creates conflict between team and end-users	40.0% (6 of 15)
ORRA -	enables end-users to introduce personal agendas into system requirements	33.3% (5 of 15)
ESE	permits end-users waste project time on attempts to perfect system functionalities	33.3% (5 of 15)
	leads to leaking of project's inside information to end-users	33.3% (5 of 15)
	leads to having a team with unnecessary people on-board	40.0% (6 of 15)
	The sources of pressure for/against having user representatives as project team members are	Freq.
	your upper management	60% (9 of 15)
	your organization's way of doing things (e.g., project management methodology)	27% (4 of 15)
PP	your project team members	0% (0 of 15)
PP	your client/sponsor	33% (5 of 15)
	your peer project managers	7% (1 of 15)
	the ideal project manager depicted in your past training	20% (3 of 15)
	the professional associations you are affiliated with	0% (0 of 15)
	Having user representatives as project team members is facilitated by having	Freq.
	the authority to choose the right user representatives.	27% (4 of 15)
	user representatives who are personally willing to participate.	33% (5 of 15)
PC	someone on the project team who can interact with the user representatives.	27% (4 of 15)
	user representatives with some knowledge of IT (its capabilities and limitations) and projects.	40% (6 of 15)
	upper management's explicit support of having user representatives	27% (4 of 15)
	a budget for having user representatives	20% (3 of 15)
	an organizational political environment that favors having user representatives	27% (4 of 15)
	SRR2	
	Showing tangible appreciation to project team members during project	Freq.
	increases [Low] team members' motivation to continue the work	50.0% (8 of 16)
ORRA -	promotes [Low] team spirit	43.8% (7 of 16)
EDE	improves [weak] relationships among the project team members	25.0% (4 of 16)
	prevents project team members' turnover	25.0% (4 of 16)
	increases [low] project team members' job satisfaction	31.3% (5 of 16)
	Showing tangible appreciation to project team members during project	Freq.
0004	leads to team members feeling they are not being treated fairly	31.3% (5 of 16)
ORRA - ESE	leads to wasting project time	25.0% (4 of 16)
	creates conflicts within the project team	25.0% (4 of 16)
	leads to team members' being overconfident about project success thus work less hard	25.0% (4 of 16)

	The sources of pressure for/against showing tangible appreciation to project team members during project are	Freq.
	your upper management	38% (6 of 16)
	your organization's way of doing things (e.g., project management methodology)	25% (4 of 16)
PP	your project team members	31% (5 of 16)
	your client/sponsor	25% (4 of 16)
	your peer project managers	25% (4 of 16)
	the ideal project manager depicted in your past training	25% (4 of 16)
	the professional associations you are affiliated with	0% (0 of 16)
	Showing tangible appreciation to project team members during project is facilitated by having	Freq.
	an adequate budget for showing tangible appreciation during the project.	50% (8 of 16)
	some time slack in the schedule to show tangible appreciation during the project.	38% (6 of 16)
PC	the authority to show tangible appreciation during the project.	31% (5 of 16)
	upper management's explicit support of showing tangible appreciation during the project.	25% (4 of 16)
	an organizational culture that favors tangible appreciations (e.g., social gatherings).	31% (5 of 16)
	SRR3	, ,
	Dedicating much effort to planning	Freq.
	provides [Lacking] an estimation of the project schedule and budget	41.7% (5 of 12)
	improves [Low] understanding of the project	66.7% (8 of 12)
	enables [not] including risk mitigation activities in the project	41.7% (5 of 12)
ORRA - EDE	prevents lacking a precise work baseline	58.3% (7 of 12)
	leads to identifying [being unaware of] critical dependencies (e.g., within the project or with other	25.0% (3 of 12)
	projects)	, ,
	prevents deviating from project schedule	50.0% (6 of 12)
	prevents not delivering what was expected	50.0% (6 of 12)
	Dedicating much effort to planning	Freq.
	leads to producing a detailed work plan likely to change later	66.7% (8 of 12)
0004	results in wasting time discussing the plan with many people	25.0% (3 of 12)
ORRA - ESE	leads to doing an activity that is perceived—especially by clients—as not valuable	25.0% (3 of 12)
	leads to limiting innovation and flexibility by committing to too much detail upfront	33.3% (4 of 12)
	leads to keeping the project team from doing the actual project work	33.3% (4 of 12)
	leads to being unable to deliver things soon, especially when there are pressures for it	33.3% (4 of 12)
	The sources of pressure for/against dedicating much effort to planning are	Freq.
	your upper management	58% (7 of 12)
	your organization's way of doing things (e.g., project management methodology)	25% (3 of 12)
PP	your project team members	25% (3 of 12)
PP	your client/sponsor	50% (6 of 12)
	your peer project managers	33% (4 of 12)
	the ideal project manager depicted in your past training	25% (3 of 12)
	the professional associations you are affiliated with	33% (4 of 12)
	Dedicating much effort to planning is facilitated by having	Freq.
	the ability to foresee the details required for planning ahead.	33% (4 of 12)
	a proper project scope definition.	33% (4 of 12)
BC BC	access to people—that will be involved in the project—to get their input.	33% (4 of 12)
PC	access to people required to answer questions about project (e.g., technical people, client)	42% (5 of 12)
	access to easy-to-use tools for planning.	33% (4 of 12)
	upper management's explicit support of dedicating much efforts to planning.	42% (5 of 12)
	some time slack to spend on project planning.	33% (4 of 12)

# **Appendix C**

# Phases 3: Survey Instrument Development and Validation Details I

A survey instrument was created, validated, and tested for each specific SRR.

**Item Development**: The reflective measures of EDE, ESE, ORRA, PP, PC, and RRD were adapted from a standard TPB questionnaire (Fishbein and Ajzen 2010). The items were worded to capture the ITPMs' own beliefs and to follow the TPB's principle of compatibility (i.e., correspond to a specific action, target of action, context, and time). For PRE, reflective items were adapted from the literature (e.g., MacCrimmon and Wehrung 1990 and Keil et al. 2000). The belief composites for EDE, ESE, PP, and PC, and the formative items for the P and L dimensions of PRE were developed through the procedure explained in Phase 2 (Appendix B). Control variables include risk propensity (adapted from Keil et al. 2000; MacCrimmon and Wehrung 1990); experience (a formative index of age, number of years of experience as ITPM, number of projects managed, and project management certification); project size (a formative index of project budget, project duration, the number of team members, and the number of users); and project management approach (agile versus waterfall versus proprietary).

**Construct Validation:** Three experts (an ITPM and two IT Ph.D. candidates) commented on the face and content validity aspects of the items, and a few adjustments to the items' wording were made. Three rounds of card sorting for the reflective measures were conducted to ensure item clarity and to perform a preliminary examination of convergent and discriminant validity (Moore and Benbasat 1991). Twelve judges (IT Ph.D. students) participated. The non-agreed-upon items were discussed until an acceptable interrater agreement was achieved (Kappa = 0.848 > 0.65, Moore and Benbasat 1991).

Minimizing Non-response Bias: To minimize non-response bias, several strategies were adopted (Sivo et al. 2006). Efforts were made to make the survey respondent-friendly by making it readable, convenient to answer, and short. A financial incentive was provided by the firm hired for online data collection. Respondents were offered personal feedback on "some aspects of their project management profile" upon survey completion. The required sample size for the main test was estimated and targeted using two approaches. First, the busiest instantiated construct had 7 composite items and 3 reflective ones, totaling 10 items. The rule of thumb of 10 times the number of items in the most crowded construct (Gefen et al. 2000) suggested N > 100. Second, a desired minimum statistical power of 80% (Goodhue et al. 2012) with a confidence interval of 95% and a medium effect size suggested N > 107 (Cohen 1992). Accordingly, a sample of N > 107 useful responses for each SRR was then targeted, and a sample of N > 111 per risk response was achieved in data collection.

Minimizing Common-Method Bias: Because both dependent and independent variables were measured with the same instrument, several procedural remedies were implemented to minimize common method bias (Podsakoff et al. 2003; 2012; Sharma et al. 2009). The survey's introduction motivated respondents to respond accurately. Further statistical tests and remedies were enabled by adding a marker variable that measured intuitive decision making in management (adapted and reduced from Pretz et al. 2014). Also, the effort required to think about the predictor and criterion variables at the same time was increased by putting the marker variable and some demographics questions between them.

**Minimizing Undesired Behaviors:** Because online panelists might exhibit undesirable response behaviors such as faking their identity, disengaging from questions, speeding, and straight-lining (Gittelman and Trimarchi 2012; Rogers and Richarme 2009), several cross-checks were programmed in the survey. These included basic IT project management knowledge questions, attention verification questions, an enforced minimum survey completion speed, and flagging straight-liners. The cross-checks were tested and adjusted several times to ensure their reliability.

**Pretest:** One ITPM and two experts (a faculty member and a Ph.D. candidate) completed the survey in the presence of the first author and commented on its clarity and form. Using their feedback, the appearance and flow of the web survey were improved.

**Pilot Test**: A pilot study was conducted to assess the psychometric properties of the constructs (N > 50 per SRR, total N = 152). The same data collection company and panel of IT managers as in the main text were used. Using a unique panelist ID provided by the data collection company ensured that the same respondents would not take part in the main survey. First, the reliability, convergent validity, and discriminant validity of the reflective measures were examined. The items with less than desirable psychometric properties were dropped, keeping at least three items per construct. Second, the multicollinearity of the composite items was verified. The VIF statistics were above the threshold of 3.3 (Petter et al. 2007) for five items, two of which were slightly above the threshold of 10 (Hair et al. 2009). After a closer examination, these items were kept because they were not tapping into the same aspect of the constructs (Petter et al. 2007). Third, the correlations of the belief composites with their reflective counterparts were verified. For the 15 relevant construct instances (5 MIMIC constructs for each of 3 SRRs), the average correlation was 0.649, which is above the observed average value of 0.5 (Fishbein and Ajzen 2010).

# Reflective Measures for All SRRs

Unless otherwise stated, all items were measured using a 7-point Likert scale (1= Strongly Disagree: 7 = Strongly Agree).

#### RRD – Risk Response Decision (7-point Semantic Differential Scale)

- I intend to [enact this risk response] in THIS PROJECT. (Definitely Do Not: Definitely Do)
- I will [enact this risk response] in THIS PROJECT. (Very Unlikely: Very Likely)
- I plan to [enact this risk response] in THIS PROJECT. (Strongly Disagree: Strongly Agree)

#### PRE - Perceived Risk Exposure

If THIS PROJECT is continued without [enacting this risk response], ...

- significant undesired events will likely happen.
- the project would become very risky.
- some significant undesired events would be very likely.

#### ORRA – Overall Attitude towards Risk Response

Overall, [enacting this risk response] in THIS PROJECT would be...

Harmful: BeneficialFoolish: Wise

· Unadvisable: Advisable

# **EDE – Expected Desired Effects**

Overall, [enacting this risk response] is ...

- essential for mitigating some significant risks in THIS PROJECT.
- important for reducing the risk exposure of THIS PROJECT.
- · vital for risk mitigation in THIS PROJECT.
- · useful for preventing significant undesired events in THIS PROJECT.

# ESE - Expected Side Effects

Overall, [enacting this risk response] will...

- create a lot of side effects in THIS PROJECT.
- impose significant costs on THIS PROJECT.
- introduce new risks to THIS PROJECT.
- increase the risk exposure of THIS PROJECT.

# PP - Perceived Pressure

In the context of THIS PROJECT, overall...

- most people and entities who are important to me (strongly discourage: strongly encourage) [enacting this risk response].
- I am (strongly advised to avoid: strongly advised to) [enacting this risk response].
- People or entities that influence my way of managing projects (strongly expect NOT to: strongly expect to) [enacting this risk response].

# **PC - Perceived Control**

In the context of THIS PROJECT ...

- if I really wanted to, I could [enact this risk response].
- I am confident that I am able to [enact this risk response], if I really wanted to.
- I have the ability to [enact this risk response], if I really wanted to.

# Belief Composites (Formative Measures) for SRR1: Having User Representatives

#### PRE - Perceived Risk Exposure

- Probability: How likely is each of the following to occur in THIS PROJECT? (Scale: 0 = Very Unlikely to Occur: 7 = Very Likely to Occur)
- Loss: How harmful would each of the following be if it occurs in THIS PROJECT? (Scale: 0 = No Significant Impact on Project's Success: 7 = Extremely Significant Impact on Project's Success)

# [Items for both questions:]

- End-user resistance
- · Delivering a system with the wrong functionalities
- Producing a not-user-friendly system interface
- Project team wasting time deciding about system functionalities
- · Failure in communicating with the end-users' community
- · Forgetting to address some user requirements

#### **EDE – Expected Desired Effects**

- Belief: To what extent would having user representatives [lead to the following items] ... (Scale: 1 = Not at All: 7 = To a Large Extent)
- Weight: In THIS PROJECT, how worthy is putting managerial efforts into each of the following items? (Scale: 1 = It Is NOT Worth the Effort: 7 = It Is Worth All the Effort)

# [Items for both questions:]

- · preventing end-user resistance
- preventing delivering a system with the wrong functionalities
- preventing producing a not-user-friendly system interface
- preventing project team wasting time deciding about system functionalities
- preventing failure in communicating with the end-users' community
- · preventing forgetting to address some user requirements

# ESE - Expected Side Effects

- Belief: To what extent would having user representatives [lead to the following items] ... (Scale: 1 = Not at All: 7 = To a Large Extent)
- Weight: How harmful would each of the following be if it occurs in THIS PROJECT? (Scale: 0 = No Significant Impact on Project's Success: 7 = Extremely Significant Impact on Project's Success)

### [Items for both questions:]

- · Conflict between team and end users
- End-users introducing personal agendas into system requirements
- · End-users wasting project time on attempts to perfect system functionalities
- · Leaking of project's inside information to end-users
- · Having a team with unnecessary people onboard

### PP - Perceived Pressure

- Belief: In the context of THIS PROJECT, to what extent do you think each of the following individuals/entities is opposed to or in favor of having user representatives as project team members? (Scale: -3 = Against: 3 = For)
- Weight: In THIS PROJECT, when it comes to deciding whether or not to have user representatives as project team members, to what extent should you comply with the expectations of the following people/entities? (Scale: 1 = Not at All: 7 = To a large extent)

# [People/entities for both questions:]

- · your upper management
- your organization's way of doing things (e.g., project management methodology)
- · your project team members
- · your client/sponsor
- · your peer project managers
- the ideal project manager depicted in your past training
- · the professional associations you are affiliated with

#### PC - Perceived Control

- Belief: In THIS PROJECT, I will have each of the following items. (Scale: 1 = Strongly Disagree: 7 = Strongly Agree)
- Weight: If you wanted to have user representatives as team members in THIS PROJECT, to what extent would each of the following be essential to have? (Scale: 1 = Not Essential to Have: 7 = Extremely Essential to Have)

#### [Items for both questions:]

- the authority to choose the right user representatives
- user representatives who are personally willing to participate
- someone on the project team who can interact with the user representatives
- user representatives with some knowledge of IT (its capabilities and limitations) and projects
- upper management's explicit support for having user representatives
- a budget for having user representatives
- · an organizational political environment that favors having user representatives

# Belief Composites (Formative Measures) for SRR2: Showing Tangible Appreciation to Project Team Members during the Project

# PRE - Perceived Risk Exposure

- Probability: How likely is each of the following to occur in THIS PROJECT? (Scale: 0 = Very Unlikely to Occur: 7 = Very Likely to Occur)
- Loss: How harmful would each of the following be if it occurs in THIS PROJECT? (Scale: 0 = No Significant Impact on Project's Success: 7 = Extremely Significant Impact on Project's Success)

# [Items for both questions:]

- · low team member motivation to continue the work
- · low team spirit
- · weak relationships among the project team members
- project team member turnover
- low project team member job satisfaction

# **EDE** – **Expected Desired Effects**

- Belief: In THIS PROJECT, to what extent would showing tangible appreciation to project team members during the project [lead to the following items] ... (Scale: 1 = Not at All: 7 = To a Large Extent)
- Weight: In THIS PROJECT, how worthy is putting managerial efforts into each of the following items? (Scale: 1 = It Is NOT Worth the Effort: 7 = It Is Worth All the Effort)

# [Items for both questions:]

- increasing team member motivation to continue the work
- · improving team spirit
- strengthening relationships among the project team members
- preventing project team member turnover
- increasing project team member job satisfaction

# ESE - Expected Side Effects

- Belief: In THIS PROJECT, to what extent would showing tangible appreciation to project team members during the project [lead to the following items] ... (Scale: 1 = Not at All: 7 = To a Large Extent)
- Weight: How harmful would each of the following be if it occurs in THIS PROJECT? (Scale: 0 = No Significant Impact on Project's Success: 7 = Extremely Significant Impact on Project's Success)

# [Items for both questions:]

- · team members feeling they are not being treated fairly
- · wasting project time
- conflicts within the project team
- team members' being overconfident about the ultimate success of the project (thus working less hard and not being fully dedicated)

#### PP - Perceived Pressure

- Belief: In the context of THIS PROJECT, to what extent do you think each of the following individuals/entities is opposed to or in favor of showing tangible appreciation during the project? (Scale: -3 = Against: 3 = For)
- Weight: In THIS PROJECT, when it comes to deciding whether or not to show tangible appreciation during the project, to what extent should you comply with the expectations of the following people/entities? (Scale: 1 = Not at All: 7 = To a large extent)

#### [People/entities for both questions:]

- · your upper management
- your organization's way of doing things (e.g., project management methodology)
- your project team members
- · your client/sponsor
- · your peer project managers
- · the ideal project manager depicted in your past training
- the professional associations you are affiliated with

### PC - Perceived Control

- Belief: In THIS PROJECT, I will have each of the following items. (Scale: 1 = Strongly Disagree: 7 = Strongly Agree)
- Weight: If you wanted to show tangible appreciation during THIS PROJECT, to what extent would each of the following be essential to have? (Scale: 1 = Not Essential to Have: 7 = Extremely Essential to Have)

#### [Items for both questions:]

- an adequate budget for showing tangible appreciation during the project
- some time slack in the schedule to show tangible appreciation during the project
- the authority to show tangible appreciation during the project
- upper management's explicit support for showing tangible appreciation during the project
- an organizational culture that favors tangible appreciation (e.g., social gatherings)

# Belief Composites (Formative Measures) for SRR3: Dedicating Much Effort to Planning

# PRE - Perceived Risk Exposure

- Probability: How likely is each of the following to occur in THIS PROJECT? (Scale: 0 = Very Unlikely to Occur: 7 = Very Likely to Occur)
- Loss: How harmful would each of the following be if it occurs in THIS PROJECT? (Scale: 0 = No Significant Impact on Project's Success: 7 = Extremely Significant Impact on Project's Success)

#### [Items for both questions:]

- · lacking an estimation of the project schedule and budget
- · low understanding of the project
- · not including risk mitigation activities in the project
- · lacking a precise work baseline
- being unaware of critical dependencies (e.g., within the project or with other projects)
- · deviating from project schedule
- · not delivering what was expected

# **EDE – Expected Desired Effects**

- Belief: In THIS PROJECT, to what extent would dedicating much effort to planning [lead to the following items] ... (Scale: 1 = Not at All: 7 = To a Large Extent)
- Weight: In THIS PROJECT, how worthy is putting managerial efforts on each of the following items? (Scale: 1 = It Is NOT Worth the Effort: 7 = It Is Worth All the Effort)

### [Items for both questions:]

- · providing an estimation of the project schedule and budget
- improving understanding of the project
- · including risk mitigation activities in the project
- · having a precise work baseline
- identifying critical dependencies (e.g., within the project or with other projects)
- preventing deviation from project schedule
- · delivering what was expected

# ESE - Expected Side Effects

- Belief: In THIS PROJECT, to what extent would dedicating much effort to planning [lead to the following items] ... (Scale: 1 = Not at All: 7 = To a Large Extent)
- Weight: How harmful would each of the following be if it occurs in THIS PROJECT? (Scale: 0 = No Significant Impact on Project's Success: 7 = Extremely Significant Impact on Project's Success)

# [Items for both questions:]

- producing a detailed work plan that would be likely to change later
- wasting time discussing the plan with many people
- doing an activity that is perceived—especially by clients—as not valuable
- limiting innovation and flexibility by committing to too many details upfront
- keeping the project team from doing the actual project work
- · being unable to deliver soon, especially when there is pressure for it

### PP - Perceived Pressure

- Belief: In the context of THIS PROJECT, to what extent do you think each of the following individuals/entities is opposed to or in favor of dedicating much effort to planning? (Scale: -3 = Against: 3 = For)
- Weight: In THIS PROJECT, when it comes to deciding whether or not to dedicate much effort to planning, to what extent should you comply with the expectations of the following people/entities? (Scale: 1 = Not at All: 7 = To a large extent)

# [People/entities for both questions:]

- · your upper management
- your organization's way of doing things (e.g., project management methodology)
- · your project team members
- · your client/sponsor
- · your peer project managers
- · the ideal project manager depicted in your past training
- the professional associations you are affiliated with

#### PC - Perceived Control

- Belief: In THIS PROJECT, I will have each of the following items. (Scale: 1 = Strongly Disagree: 7 = Strongly Agree)
- Weight: If you wanted to dedicate much effort to planning THIS PROJECT, to what extent would each of the following be essential to have? (Scale: 1 = Not Essential to Have: 7 = Extremely Essential to Have)

# [Items for both questions:]

- the ability to foresee the details required for planning ahead
- · a proper project scope definition
- access to people—who will be involved in the project—to get their input
- · access to people required to answer questions about project (e.g., technical people, client)
- · access to easy-to-use tools for planning
- upper management's explicit support of dedicating much effort to planning
- · some time slack to spend on project planning

# Control Variables for All SRRs

# Risk Propensity (Reflective) (5-point scale)

- How would you rate your own willingness to take risks when managing IT projects compared to other individuals? (Much Less Willing/ Much More Willing)
- I believe that I am a risk-taker when managing IT projects. (Strongly Disagree/Strongly Agree)
- To me, IT project managers' taking risks when managing IT projects is (Very Bad/Very Good)

# **Project Size**

What is the approximate budget of THIS PROJECT?

- Less than \$100,000
- \$100,000 to \$1,000,000

- \$1,000,000 to \$10,000,0000
- \$10,000,000 or more

# What is the estimated duration of THIS PROJECT?

- 3 months or less
- 3 to 6 months
- 6 to 12 months

- 12 to 18 months
- 18 to 24 months
- 24 months or more

How many people (including yourself) are in the core team of THIS PROJECT?

• 4 people or fewer

• 20 to 49 people

• 5 to 19 people

• 50 people or more

How many end-users (including the organization's clients or customers) will directly interact with the system delivered by THIS PROJECT?

• 1 to 50

• 1,000 to 10,000

• 50 to 500

• 10,000 to 100,000

• 500 to 1,000

• 100,000 or more

# **Experience**

How old are you?

- 25 years or less
- 26-30 years
- 31 to 40 years
- 41 to 50 years
- 51 years or more

How many years of IT project management experience do you have?

· Less than 1 year

• 6 to 10 years

• 16 to 20 years

• 1 to 5 years

• 11 to 15 years

· 21 years or more

How many IT projects have you managed (in whole or in part) in your career?

- 10 projects or fewer
- 11 to 20 projects
- 21 to 50 projects
- 51 projects or more

Are you a certified project manager?

Yes

• No

# **Project Management Approach**

The software development approach adopted for THIS PROJECT is...

- Waterfall (or its variants)
- Agile (or its variants)
- The organization's proprietary methodology
- · No specific methodology

•	Other										

**Data Collection:** A data collection company—Empanel Online—with a panel of over 30,000 North American IT managers, with high variance of industries and experience was hired to distribute the survey widely. A total of 20,000 panelists were invited to complete the survey. The targeted demographics were verified with screening questions, after which respondents were randomly assigned to one of the three SRRs. The survey link was inactivated after reaching the response quota of N > 107 per SRR, but those who already had started the survey were allowed to finish it which led to 112, 116, and 121 complete responses (N > 111) respectively for the three SRRs. Out of the 20,000 invited panelists, 3,567 entered the survey. After the initial screening questions, 573 respondents started the main questionnaire. Of these, 349 completed the task (185 of the 573 missed an attention verification question, 31 were identified as speeders or straight-liners, and 8 voluntarily abandoned). This represents an incidence rate (i.e., survey completed/started) of 9.8% (= 349/3,567).

**Non-response Bias:** Non-response bias was examined by comparing early and late responses (Sivo et al. 2006). Mean difference tests of the principal constructs suggested no significant difference between these two groups; therefore, non-response bias was not a viable threat. A Shapiro-Wilk test of data normality for the reflective items suggested a non-normal distribution (p = 0.000). While no skewness value was found to be higher than the threshold of 2 (Ghiselli et al. 1981), for some of the items kurtosis was above 2, up to 5.1 for one PC item. Since the kurtosis was still below 7, the data was deemed moderately normal (Curran et al. 1996). For descriptive and survey statistics, see Table C1.

Common Method Bias: The influence of this bias was tested. First, a Harman's single factor test was performed using principal component analysis with no rotation (Podsakoff and Organ 1986). The variance explained by the first factor was respectively 35.5%, 23.4%, and 31.0% for the SRRs. Thus, the first component does not "account for the majority of the covariance among the measures" (Podsakoff et al. 2003, p. 889). Moreover, when significant common method variance is present, "a single factor will emerge from the factor analysis" (Podsakoff et al. 2003, p. 889); however, the second component for each SRR also explains a considerable portion of variance in the data (10.7%, 17.9%, and 13.7% respectively). Second, the highest correlation between constructs was 0.758 (between ORRA and its EDE dimension for SRR1), which is below the threshold of 0.9 (Pavlou and El Sawy 2006). Third, using marker variable items, the procedure suggested by Rönkkö and Ylitalo (2011)—which adapts the procedure of Lindell and Whitney (2001) to PLS—was implemented. Initially, the mean correlation of the measured marker variable items with all other items in the model was examined. This correlation was respectively 0.003, 0.105, and 0.174 for the three SRRs, which is above 0.05 (Rönkkö and Ylitalo 2011) for two SRRs. Therefore, the measured marker variable was included as an antecedent to all the model's endogenous constructs (Rönkkö and Ylitalo 2011). Because this did not change the significance of any path,

it was deemed unnecessary to partial out the effect of a marker variable or a method factor (Rönkkö and Ylitalo 2011). Together, the results of these three approaches suggest that common method bias does not influence the results.

Table C1. Des	scriptive Statis	tics											
						Spec	cific Ris	sk Resp	onse				
			SRR1 (	N = 112	)		SRR2 (	N = 116	)		SRR3 (	N = 121	)
Construct	ltem	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.
Reflective Items	5												
Risk	R_RRD_1	1	7	5.5	1.6	1	7	6.0	1.1	1	7	6.0	1.3
Response Decision	R_RRD_2	1	7	5.5	1.6	1	7	6.1	1.2	1	7	5.9	1.4
(RRD)	R_RRD_4	1	7	5.6	1.5	1	7	6.1	1.0	1	7	6.0	1.3
Perceived Risk	R_PRE_2	1	7	4.8	1.6	1	7	4.6	1.7	1	7	5.3	1.7
Exposure	R_PRE_4	1	7	4.5	1.8	1	7	4.1	1.8	1	7	5.1	1.8
(PRE)	R_PRE_5	1	7	4.9	1.5	1	7	4.6	1.7	1	7	5.1	1.7
Expected	R_EDE_1	1	7	5.3	1.4	1	7	4.9	1.5	2	7	5.8	1.2
Desired	R_EDE_3	1	7	5.1	1.5	1	7	4.8	1.6	1	7	5.6	1.2
Effects (EDE)	R_EDE_4	2	7	5.7	1.2	1	7	5.2	1.5	2	7	6.0	1.1
	R_ESE_2	1	7	4.3	1.6	1	7	3.4	1.8	1	7	3.8	1.9
Expected Side Effects (ESE)	R_ESE_3	1	7	4.0	1.7	1	7	3.4	1.8	1	7	3.7	1.9
Liicots (LOL)	R_ESE_4	1	7	3.9	1.8	1	7	3.4	1.8	1	7	3.5	2.0
Overall Risk	R_ORRA_1	3	7	6.0	1.2	1	7	6.3	0.9	2	7	6.3	1.1
Response Attitude	R_ORRA_2	2	7	5.9	1.3	1	7	6.0	1.2	2	7	6.2	1.1
(ORRA)	R_ORRA_4	1	7	5.7	1.4	1	7	6.1	1.1	1	7	6.1	1.1
	R_PP_2	1	7	5.3	1.3	2	7	5.4	1.2	2	7	5.7	1.3
Perceived Pressure (PP)	R_PP_3	1	7	5.2	1.5	1	7	5.5	1.3	2	7	5.6	1.3
r ressure (r r )	R_PP_4	1	7	5.2	1.4	1	7	5.3	1.3	2	7	5.5	1.3
	R_PC_1	2	7	6.1	1.0	4	7	6.4	0.7	1	7	6.1	1.2
Perceived Control (PC)	R_PC_2	3	7	6.2	0.9	2	7	6.3	1.0	1	7	6.1	1.2
Control (1 C)	R_PC_3	1	7	6.0	1.2	4	7	6.4	8.0	2	7	6.1	1.2
Belief Composi	tes					_		_				_	
Expected Desired Effects (EDE)	EDE_X_AVG	8.0	49.0	30.5	8.8	13.0	49.0	36.1	7.5	5.1	49.0	33.1	7.9
Expected Side Effects (ESE)	ESE_X_AVG	1.0	43.4	19.5	9.8	0.0	37.8	13.9	9.0	3.2	43.2	17.8	9.1
Perceived Pressure (PP)	PP_X_AVG	-3.7	19.0	7.3	5.1	-8.6	21.0	8.5	5.4	-4.3	21.0	7.9	4.7
Perceived Control (PC)	PC_X_AVG	8.6	49.0	34.4	7.2	11.0	49.0	33.0	7.3	14.9	49.0	33.4	7.7

# Survey Statistics

Table C2. Cons	struct Cross	-Correlation	s and Ite	m Weigh	ts for SRI	R1: Havin	g User Re	presentati	ves
<b>Construct Cross</b>	-Correlations	with √(AVE) o	on the Dia	gonal					
	L	Р	PRE	EDE	ESE	ORRA	PP	PC	RRD
L	Formative								
P	0.322	Formative							
PRE	0.346	0.259	0.872						
EDE	0.264	0.134	0.708	0.890					
ESE	0.119	0.281	-0.133	-0.241	0.838				
ORRA	0.239	0.158	0.575	0.758	-0.256	0.910			
PP	0.282	0.128	0.431	0.614	-0.219	0.662	0.877		
PC	0.140	-0.020	0.288	0.402	-0.167	0.425	0.462	0.752	
RRD	0.212	0.081	0.481	0.694	-0.177	0.671	0.636	0.372	0.929
Item Weights		•	•					•	
	L	Р	PRE	EDE	ESE	ORRA	PP	PC	RRD
PRE_2	Formative	Formative	0.891	0.704	-0.095	0.608	0.428	0.265	0.518
PRE_4	_	-	0.867	0.581	-0.086	0.452	0.389	0.228	0.402
PRE_5	_	-	0.858	0.557	-0.170	0.431	0.303	0.260	0.326
EDE_1	_	-	0.663	0.911	-0.339	0.669	0.519	0.320	0.577
EDE_3	_	-	0.663	0.892	-0.118	0.679	0.618	0.363	0.665
EDE_4	_	_	0.558	0.867	-0.186	0.676	0.498	0.394	0.611
ESE_1	_	_	0.021	-0.095	0.700	-0.096	-0.057	-0.113	-0.004
ESE_2	_	-	-0.184	-0.199	0.880	-0.196	-0.188	-0.098	-0.128
ESE_4	_	-	-0.092	-0.252	0.917	-0.283	-0.230	-0.198	-0.217
ORRA_1	_	-	0.525	0.704	-0.241	0.922	0.615	0.366	0.637
ORRA _2	_	-	0.520	0.658	-0.248	0.895	0.470	0.348	0.503
ORRA_4	_	_	0.523	0.702	-0.214	0.912	0.704	0.441	0.676
PP_2	_	-	0.337	0.496	-0.242	0.566	0.877	0.366	0.524
PP_3	_	_	0.348	0.486	-0.156	0.548	0.826	0.354	0.478
PP_4	_	_	0.438	0.618	-0.182	0.623	0.925	0.480	0.650
PC_1	-	_	0.124	0.278	-0.283	0.286	0.290	0.629	0.113
PC_2	-	_	0.162	0.308	-0.275	0.266	0.262	0.719	0.195
PC_3	_	_	0.293	0.340	-0.022	0.391	0.444	0.886	0.399
RRD_1	-	_	0.495	0.649	-0.113	0.636	0.535	0.359	0.912
RRD_2	-	-	0.445	0.655	-0.159	0.609	0.590	0.344	0.947
RRD_4	_	_	0.403	0.630	-0.217	0.623	0.645	0.335	0.927

Table C3. Con Project Team N				m Weigh	ts for SRI	R2: Showi	ng Tangib	le Appreci	ation to
Construct Cross	-Correlations	with √(AVE) o	on the Dia	gonal					
	L	Р	PRE	EDE	ESE	ORRA	PP	PC	RRD
L	Formative								
Р	0.118	Formative							
PRE	0.362	0.237	0.905						
EDE	0.302	0.105	0.653	0.898					
ESE	-0.048	0.223	0.271	0.275	0.882				
ORRA	0.310	-0.056	0.158	0.294	-0.257	0.818			
PP	0.299	0.024	0.255	0.330	-0.003	0.382	0.855		
PC	0.091	-0.070	-0.128	-0.101	-0.281	0.401	0.380	0.874	
RRD	0.291	-0.062	0.172	0.181	-0.255	0.611	0.412	0.184	0.832
Item Weights	•								
	L	Р	PRE	EDE	ESE	ORRA	PP	PC	RRD
PRE_2	Formative	Formative	0.905	0.570	0.295	0.121	0.312	-0.032	0.129
PRE_4	_	_	0.878	0.575	0.213	0.111	0.128	-0.237	0.165
PRE_5	_	_	0.930	0.627	0.227	0.194	0.243	-0.092	0.176
EDE_1	_	_	0.620	0.926	0.281	0.256	0.285	-0.118	0.178
EDE_3	_	_	0.633	0.922	0.326	0.234	0.255	-0.094	0.108
EDE_4	_	_	0.498	0.844	0.116	0.311	0.360	-0.056	0.209
ESE_1	_	_	0.197	0.204	0.835	-0.224	-0.053	-0.165	-0.172
ESE_2	_	_	0.276	0.259	0.906	-0.226	0.074	-0.239	-0.279
ESE_4	_	_	0.239	0.260	0.903	-0.231	-0.039	-0.332	-0.216
ORRA_1	_	_	0.018	0.151	-0.322	0.801	0.294	0.379	0.578
ORRA _2	_	_	0.279	0.348	-0.133	0.782	0.363	0.289	0.359
ORRA _4	_	_	0.127	0.250	-0.151	0.869	0.291	0.304	0.533
PP_2	_	_	0.149	0.333	-0.042	0.288	0.772	0.339	0.232
PP_3	_	_	0.271	0.293	0.088	0.346	0.873	0.373	0.304
PP_4	_	_	0.226	0.258	-0.042	0.343	0.913	0.296	0.457
PC_1	_	_	-0.204	-0.179	-0.317	0.258	0.281	0.860	0.144
PC_2	-	_	-0.043	-0.027	-0.170	0.392	0.361	0.886	0.185
PC_3	-	_	-0.107	-0.076	-0.270	0.389	0.347	0.875	0.147
RRD_1	-	_	0.161	0.160	-0.229	0.499	0.252	0.146	0.803
RRD_2	-	_	0.176	0.233	-0.181	0.558	0.411	0.102	0.891
RRD_4	_	_	0.085	0.035	-0.242	0.461	0.353	0.231	0.801

Table C4. Co	nstruct Cross	s-Correlation	s and Iter	n Weigh	ts for SRF	R3: Dedic	ating Mucl	h Effort to	
Construct Cros	s-Correlations	with √(AVE)	on the Diag	gonal					
	L	P	PRE	EDE	ESE	ORRA	PP	РС	RRD
L	Formative								
Р	0.205	Formative							
PRE	0.384	0.134	0.921						
EDE	0.267	0.083	0.644	0.888					
ESE	0.024	0.025	-0.107	0.015	0.870				
ORRA	0.245	0.070	0.459	0.606	-0.113	0.938			
PP	0.294	0.131	0.279	0.480	-0.012	0.536	0.884		
PC	0.195	0.189	0.155	0.268	-0.021	0.333	0.436	0.871	
RRD	0.206	0.143	0.378	0.566	0.106	0.669	0.497	0.398	0.882
Item Weights	•	•	•	•	•	•	•	•	•
	L	Р	PRE	EDE	ESE	ORRA	PP	PC	RRD
PRE_2	Formative	Formative	0.913	0.576	-0.106	0.400	0.269	0.177	0.333
PRE_4	_	_	0.914	0.576	-0.033	0.400	0.191	0.057	0.370
PRE_5	_	_	0.936	0.626	-0.150	0.465	0.304	0.188	0.343
EDE_1	_	_	0.591	0.890	-0.009	0.581	0.427	0.228	0.565
EDE_3	_	_	0.571	0.893	-0.006	0.559	0.425	0.272	0.498
EDE_4	_	_	0.554	0.882	0.059	0.468	0.427	0.213	0.436
ESE_1	_	_	-0.087	-0.017	0.829	-0.045	0.023	0.001	0.121
ESE_2	_	_	-0.112	0.025	0.952	-0.141	-0.040	-0.040	0.082
ESE_4	_	_	-0.010	0.044	0.824	-0.021	0.078	0.063	0.109
ORRA_1	_	_	0.442	0.556	-0.135	0.934	0.505	0.324	0.632
ORRA _2	_	_	0.384	0.538	-0.052	0.934	0.477	0.267	0.590
ORRA _4	_	_	0.460	0.607	-0.126	0.946	0.523	0.342	0.655
PP_2	_	_	0.185	0.351	-0.061	0.458	0.865	0.415	0.404
PP_3	_	_	0.286	0.481	0.024	0.485	0.906	0.373	0.509
PP_4	_	_	0.259	0.428	-0.003	0.478	0.880	0.373	0.385
PC_1	_	_	0.100	0.176	0.036	0.181	0.322	0.800	0.266
PC_2	_	_	0.124	0.249	-0.008	0.306	0.400	0.888	0.360
PC_3	_	_	0.171	0.262	-0.065	0.355	0.409	0.920	0.394
RRD_1	_	_	0.358	0.544	0.118	0.594	0.401	0.239	0.890
RRD_2	_	_	0.267	0.420	0.077	0.600	0.438	0.392	0.915
RRD_4	_	_	0.379	0.537	0.087	0.574	0.474	0.416	0.838

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