

# WEB-BASED SYSTEM: NECESSITY OR HYPE?

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**Abstract:** Directed by the Organizational Uncertainty theory, we have been studying different types of organizations. This report focuses on the preliminary results of surveys as the current status of the seven military MDRC's (Medical Department of Research Center) included in our study. The purpose is to get perspectives from different levels/sides of the organization, the committee members and researchers, of the need of a web-based system. After the review and discussion of the survey results, future plan is presented.

## INTRODUCTION

The two prevailing social sciences models, game theory and social learning theory, assume the existence of a 1:1 mapping between interdependent states of cognition and behavior, leaving no room for the collapse of interdependence; e.g., by measurements or decision-making. Social scientists assumed that an agent acts upon its "believes", "perspectives" and "observation", i.e., what it "sees" around it at any one point in time. But in various studies, scholars presented opposing findings. For example, in Baumeister and his colleagues' meta-analysis of self-esteem combined with confirmatory performance data (2005), they found an insignificant association between self-reported self-esteem with the actual data from academic or work performance. Kelley (1992) found that self-reported preferences before playing games were not associated with the actual choices made during games in his study on game theory in social psychology. Lawless and his colleagues (2000) found no associations in multiple regressions between book knowledge of air combat maneuvering and the actual performances of USAF combat fighter pilots. These agree with the discrepancy found between the views of managers and the decisions made by their organizations (Bloom et al., 2007). To explain the discrepant findings, we assume that observational data (self-reports, surveys, interviews) can be independent of action data. We expect, however, that states of interdependence can work to integrate these two together.

Directed by the Organizational Uncertainty theory, we have been studying different types of organizations. We have been developing theory for a computational model of organizations and decision-making. Problem presented itself as the type of information available to deciders. And even when the decision makers have access to the same data/information, their decision or interpretation might differ. For example, in the 2008- 2009 economy crisis, analysts from opposing sides of the market, reviewing the same data, both concluded that the problem is the lending system but with very different explanations (Wall Street Journal, April 20,

## CASE BACKGROUND

After a series of case studies on the organizational performance of a single military Medical Department Research Center (MDRC) compared to its six fellow units geospatially located across the US, we concluded that the focal MDRC had a clear mission and vision, but few tools at its disposal to determine whether its mission was being clearly met, whether its productivity was sufficient for its size, or whether its operations were being sufficiently changed over time to meet its vision for its future operations. It is important to use feedback not only to fine tune an organization's effectiveness over the short term, but to address the revision of its mission over the long term by regularly attempting to restructure to meet its vision (Smith & Tushman, 2005). We have proposed an organizational uncertainty principle that links uncertainty between planning and execution as well as between resource availability and the rate of plan execution (Lawless et al., 2007). One goal is to help their Centers to become more productive; however, at the same time, MDRC's want to become transformative. To be able to help them achieving these two seemingly contradictory goals, we are collecting data and analyze them to provide some insights and suggestions. The first set of data available which we are presenting comes from a survey. The survey served multiple purposes: to investigate the existence of "illusion"(bistable interpretations, an agent only "sees" one presentation of the data at one time while the other interpretation exists simultaneously) or "oscillations" (interaction/different perspectives "rock" back and forth between groups); to evaluate current system; and to assess the validity of web-based system.

## CURRENT STATUS

The military (Wood, 2007) has funded a secure web-based system for one MDRC for the submission of IRB research protocols by its investigators. To modify the data gathering processes and to increase the timeliness of analyses, a real-time web-based data collection and analysis system was initially proposed that morphed into an eIRB (electronic Institutional Review Board system) to handle the research protocols submitted by its researchers for approval by the MDRC's human and animal IRB committee. Included in the proposal was an electronic review of each protocol's scientific merits. The eIRB was funded at the end of FY 2008 (September 30th).

However, and surprisingly, well before the installation of the eIRB and before data collection could begin and the data could be analyzed to determine the operational results of the focal MDRC, the Department of Defense (DoD) liked the proposal so much that it initiated a review of the electronic data collection processes to decide whether to mandate its implementation across DoD for all IRBs (Lawless et al., 2009).

In this update of our previous case studies, only self-reported data collected at six of the MDRCs from IRB committee members (N=56) and researchers (N=202) were available for analysis (one site was absent). We discuss results from two different "sides" of organization to try to get "insights" of the validity of web-based system. The results should facilitate our understanding of the needs (or not) and whether the web-based system will contribute to an organization's effectiveness and mission from different perspectives.

First, to test the necessity of the business process redesign, we propose Hypothesis 1. If both the researchers and committee members are not satisfied with current system then it warrants a "change" of redesign of the current process. According to the verbal complains and unofficial record that the researchers and staff often express frustrations about the time-consuming submission process. This self reported data will either confirm or deny our assumptions of the independence of observational and action data.

*H1: There is no significant difference between researchers' and committee members' satisfaction level of the current system.*

*H2: There is no significant difference between researchers' and committee members' satisfaction level of the web-based system.*

Then, when the data is available, we want to find out whether there is any difference between the two groups' perceptions of the current and web-based systems. We propose to test the following two hypotheses.

*H3: There is no significant difference between researchers' perceived satisfaction of the manual and Web-based IRB systems.*

*H4: There is no significant difference between committee members' perceived satisfaction of the manual and Web-based IRB systems*

## RESULTS AND DISCUSSION

Researchers were asked 10 questions and Committee members were asked 13 questions (see appendix). To directly test our Hypothesis 1, researchers question (RQ) #9, "Overall I am satisfied with the current protocol submission and approval process" was used. To test committee members' satisfaction of the current system, committee question (CQ) #12, "Overall I am satisfied with the current protocol review process" was used. The researcher satisfaction distribution is listed in Table 1. The committee satisfaction distribution is listed in Table 2.

	Count	Percentage
Strongly Agree	1	2%
Agree	15	26%
Neutral	15	26%
Disagree	15	26%
Strongly Disagree	11	19%
TOTAL	57	

**Table 1: researcher satisfaction**

RQ9: Overall I am satisfied with the current protocol submission and approval process

	Count	Percentage
Strongly Agree	8	16%
Agree	33	65%
Neutral	6	12%
Disagree	4	8%
Strongly Disagree	0	0%
TOTAL	51	

**Table 2: committee satisfaction**

CQ12 Overall I am satisfied with the current protocol review process

Using the top 2 ratings (Strongly Agree and Agree), the committee members are more satisfied with the current system ( $\approx 80\%$ ) than the researchers ( $\approx 28\%$ ). With the high committee satisfaction level, there seems no justification to change the current system from the reviewing process point of view. But from the low satisfaction rate of researchers' assessment of the submission process, it seems that a change is warranted. This maybe because committee members feel they have more control of the process.

To test our Hypothesis 2, researchers question (RQ) #10, "A web based protocol submission system would be beneficial" and committee question (CQ) #13, "A web based protocol review system would be beneficial" were used. The researcher result is listed in Table 3. The committee result is listed in Table 4.

Strongly Agree	19	33%
Agree	28	48%
Neutral	10	17%
Disagree	0	0%
Strongly Disagree	1	2%
TOTAL	58	

**Table 3: Researcher**

Q10: A web based protocol submission system would be beneficial

Strongly Agree	15	29%
Agree	21	41%
Neutral	13	25%
Disagree	2	4%
Strongly Disagree	0	0%
TOTAL	51	

**Table 4: Committee**  
Q13 A web based protocol review system would be beneficial

We only use the top two levels data (Strongly Agree and Agree) for our analysis and discussion. Researchers' satisfaction level of the current system is low; but they perceive the web-based system would be beneficial (81%). And though about 80% of the committee members are satisfied with the current system, 70% of them think a web-based system would be beneficial also. Our expectation of oscillations occurred.

To be able to look more closely at these different interpretations and oscillations between committee members and researchers regarding the present manual IRB system of protocols and the soon to be operational web-based system, t-tests were performed over the five questions that both committee members and researchers answered. The five questions are listed in Table 5, along with t-test significances. Before discussing these results, Table 6 lists the mean differences between the two groups and the valences of the responses for each of the five questions.

			T-Test	
CQ8, RQ6	CQ9, RQ7	CQ10, RQ8	CQ12, RQ9	CQ13, RQ10
5.4E-07	0.0036	0.0022	1.2E-09	0.37

Table 5. CQ = COMMITTEE QUESTION; RQ =RESEARCHER QUESTION

- CQ8, RQ6- Communication between committee members and the protocol coordinators is good
- CQ9, RQ7-I need to communicate with the protocol coordinators often to understand what is needed for meeting
- CQ10, RQ8-Interactions between the IRB and researchers are helpful
- CQ12, RQ9-Overall I am satisfied with the current protocol review process
- CQ13, RQ10-A web based protocol review system would be beneficial

	AVG Difference	
CQ8,RQ6	0.85	CQ8>RQ6
CQ9,RQ7	-0.55	CQ9<RQ97
CQ10,RQ8	0.48	CQ10>RQ8
CQ12,RQ9	1.23	CQ12>RQ9
CQ13,RQ10	-0.14	CQ13<RQ10

Table 6. Average differences and valences

For the t-tests, first, committee members significantly believed that communications with the researchers were helpful.

Second, researchers felt the need to communicate with protocol coordinators significantly more than did the committee members. Third, committee members reported getting significantly more out of their interactions with the researchers. Fourth, committee members were significantly more satisfied than the researchers with the present protocol system. And finally, the researchers believed significantly more than committee members that a web-based system would be a beneficial improvement to the current manual system. It will be interesting to see how these self-reports change by site and over time as the new system becomes operational.

## FUTURE PLAN

When data is available, we want to test our hypotheses 3 and 4. Then, the next step is to test the correlations and variances and reanalyze the data on a site by site basis. Second, we want to construct panel data to observe the oscillations over time. To fulfill our original goal as first posed (reviewed in Wood et al., 2009) we want to anchor the data with actual performance metrics. Finally, we plan to consider standard deviations in the data to test for Fourier pairs:  $\Delta R$  and  $\Delta t$ , for resource and time couples; or for site cultural-business model worldview and execution efficiency couples, or  $\Delta WV$  and  $\Delta v$ .

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## **APPENDIX: Survey questions**

### **Committee Member**

- Q1: Meeting documents are well organized and easy to follow
- Q2: Meeting documents are distributed in sufficient time for my review
- Q3: My responsibilities as a committee member are clear
- Q4: Submitted protocol packets are complete
- Q5: Reviewed protocols require few revisions
- Q6: I use the protocol and consent checklists
- Q7: It is clear when I am a primary reviewer for a protocol
- Q8: Communication between committee members and the protocol coordinators is good
- Q9: I need to communicate with the protocol coordinators often to understand what is needed for meeting
- Q10: Interactions between the IRB and researchers are helpful
- Q11: Meeting minutes and agendas are accurate
- Q12: Overall I am satisfied with the current protocol review process
- Q13: A web based protocol review system would be beneficial

### **Researchers**

- Q1: Protocol templates are easy to find
- Q2: Protocol instructions are easy to understand
- Q3: Required documents for protocol submission are well defined
- Q4: Regulatory requirements for doing research are clearly communicated to me
- Q5: I am satisfied with the time it takes for protocol approval
- Q6: Communication between researchers and the protocol coordinators is good
- Q7: I need to communicate with the protocol coordinators often to understand what is needed for a complete protocol
- Q8: Interactions between the IRB and researchers are helpful
- Q9: Overall I am satisfied with the current protocol submission and approval process
- Q10: A web based protocol submission system would be beneficial