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ABSTRACT
There is little direct evidence that management information systems (MIS) deliver measurable value at the organizational level. The lack of measurable value is a critical source of project risk since commitment is often dependent on the MIS's perceived value. This manuscript builds on previous research frameworks to propose an assertion based Target State Specific Outcome (TSSO) model to drive project scoping. The TSSO model serves to: a) leverage stakeholder objectives to define an MIS project scope that will be aligned and integrated into an organization's strategic initiatives, b) provide a means of developing MIS project measurement objectives that ensure recognizable business value to the strategic business initiative, and c) ensure that key risks are appropriately identified.

KEYWORD
project management, risk, scoping, strategic initiatives, methodology, balanced scorecard

Motivation
Though leveraging information technology to improve private and public sector productivity is often cited as the basis of the economic expansion of the late nineteen nineties, there has been an ongoing debate in the literature about how to measure MIS business value within the firm. Specifically there is conflicting evidence regarding whether IS projects can deliver measurable value at the organizational level (Brynjolfsson 1993, Due 1993, Due 1994, Brynjolfsson & Hitt 1998, Dewan & Kraemer 1998).

In their third-generation balanced score card "strategy maps," Kaplan and Norton (2004) contribute to this MIS productivity debate by stating that knowledge and technology assets seldom have a direct impact on financial outcomes such as increased revenues, lowered costs, and higher profits. However, Kaplan and Norton go on to state that these assets delivering indirect value are the ultimate source for creating sustainable value for the organization. This quandary over value places MIS project teams in an untenable situation when asked to provide measurable business value.

Projects are the basic unit organizations use to manage their IS development efforts, but, historically, IS projects have been characterized by a notoriously high failure rate (Johnson 1995). For example, the Standish Group reported in 1994 that U.S. companies had spent more than $250 billion each year in the early 1990s on IS projects, with only 16.2% ultimately considered successful by their IS executives (Standish 1994). A Standish Group 2001 report (Standish 2001) found that, although U.S. companies invested four times more money in IS projects on an annual basis in 2000 than they did in the 1990s, only 28% were considered successful. These results further suggest that the success rate of IS projects, though improving, was and continues to be low. These results further suggest that an enormous amount of resources are expended by U.S. companies on failed IS projects. Thus, they have a strong economic incentive to improve their IS project performance (Xia & Lee 2004). One explanation for the high failure rate is that managers are not taking prudent measures to assess and manage project risks. Advocates of software project risk management claim that by countering these threats to success, the incidence of failure can be reduced (Keil, *et al.* 1998).

A review of the IS literature fails to show significant discussion of IS project scoping methods other than general discussion of broadly defined characteristics of project scope. This research proposes that much can be done in Management Information System (MIS) project scoping to: a) leverage stakeholder objectives to define an MIS that will be aligned and integrated into an organization's strategic initiatives, b) provide a means of developing MIS measurement objectives that ensure recognizable business value, and c) identify project risks that, when properly managed, can reduce the incidence of project failure.

theoretical foundation

Alignment and integration of a specified project with a business strategy requires that the business strategy objectives be clearly and concisely stated. The associated strategic initiatives that are intended to achieve the strategic objectives must be focused and clearly defined. In addition, the strategic initiative must identify metrics that will enable a successful strategy decision, that is to say a decision that the strategy was either successful or not successful.

One method for achieving this clarity in strategy is the use of third-generation balanced scorecards and strategy maps as described by Kaplan and Norton (2004). Kaplan and Norton's *Strategic Theme* creates the boundary and outline that are used to define the strategic initiatives, which are the means to create results defined in the *Objectives* and *Measurement* (as seen in Figure1). The *Action Plans* are identified by identifying *Initiatives* and their associated *Budgets* at each level of perspective defined in the balanced scorecard. The example used in this paper is highlighted in Figure 1: Kaplan and Norton's Strategic Theme Framework.

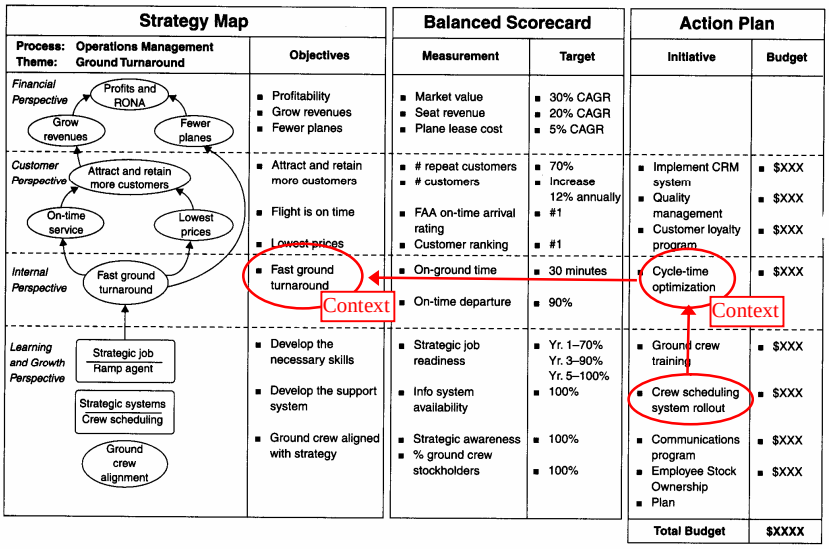

Figure 1: Kaplan and Norton's Strategic Theme Framework Example Adapted From Kaplan and Norton (2004)

The new TSSO method proposed in this paper will use the context of a strategic initiative and a strategic objective to effectively define an MIS project scope as shown in Figure 1. This method is proposed for strategically motivated MIS projects. The first context provides understanding of the intent of the strategic initiative and determining exactly what is expected from the strategic initiative. The second context provides understanding the intent and the expectations of a specific MIS project as it pertains to the strategic initiative. While it follows in the example within Figure 1 that the intent of the Crew Scheduling System is to support the Cycle-time optimization strategic initiative and the intent of the strategic initiative is to implement thirty minute ground turnaround, the specific scope and objectives cannot be clearly identified without some additional analysis and understanding. The proposed TSSO method is one means of performing the analysis such that a specific MIS project scope can be effectively developed.

Recognizing that managing MIS project risks impacts project success and that it is important to identify risks early in a project, a framework for risk identification that can be applied to the project scoping task is required. Keil *et al.* developed a risk categorization framework that will be used in this paper (See Figure 2: A Risk Categorization Framework adapted from Keil *et al.*,1998). Keil *et al,* reported the results of a Delphi study in which experienced software project managers identified

and ranked the most important risks. In their study, nearly a dozen factors were viewed as important by all three panels, suggesting the existence of a universal set of risks with global relevance. The top three risk factors were 1) lack of top management commitment to the project, 2) failure to gain user commitment, and 3) misunderstanding the requirements. Risks that were viewed to be most serious were often those seen as being outside the direct control of the project manager. Based on these findings, the framework for classifying software project risks was developed using two dimensions: perceived level of control, and perceived relative importance of the risk.

A two by two risk framework was developed that identifies and groups risks by perceived importance and perceived level of control. The four quadrants (the numbers are for reference only and do not imply sequence or priority) are 1) Customer Mandate, 2) Scope and Requirements, 3) Execution, and 4) Environment. These quadrant names were derived based on the risks that were assigned to the quadrant in the Keil *et al.* study. Quadrant 1 (Customer Mandate) risks capture the notion that successful projects are those that have the commitment of both senior management and system users. Quadrant 2 (Scope and Requirements) risks involve the ambiguities and uncertainties that arise in establishing the project's scope and requirements. Quadrant 3 (Execution) risks are concerned with the actual execution of the project. The risks in this quadrant include many of the traditional pitfalls associated with poor project management. Quadrant 4 (Environment) risks can be traced to the project environment that exists both inside and outside the organization. Examples of Quadrant 4 risks include changes to scope and requirements and conflicts that may arise between user departments.

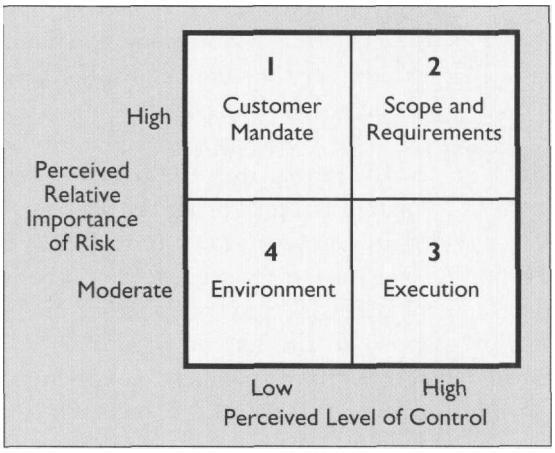

Figure 2: A Risk Categorization Framework (Keil *et al.* 1998)

The Target State Specific Outcome (TSSO) ModeL

There is a dearth of research related to effective MIS project scoping methods. A review of the IS literature fails to show significant discussion of IS project scoping methods other than general discussion of broadly defined characteristics of project scope. To fill this gap, this manuscript proposes a new method for scoping MIS projects. This paper will use the strategic initiatives of the Kaplan and Norton framework and the Keil *et al.* risk framework to describe a method for project scoping that will a) leverage stakeholder objectives to define an MIS that will be aligned and integrated into an organization's strategic initiatives, b) provide a means of developing MIS measurement objectives that ensure recognizable business value, and c) identify project risks that, when properly managed, can reduce the incidence of project failure.

Within the proposed Target State Specific Outcome (TSSO) model for defining project scope, the resulting hierarchy of objectives for a strategic initiative ensures the appropriate perspective and boundary of the problem to be solved. Stakeholders of the strategic initiative will define their needs using an adaptation of Kaplan and Norton's "Internal Perspective" of the organization (Kaplan & Norton 2004). The stakeholder needs will ensure that the MIS objectives are comprehensive, aligned, and support the strategic initiative measures. This stakeholder input will also ensure that the MIS project integrates the organization's other indirect value assets, as described by Kaplan and Norton.

MIS project risks will be identified at each step of the method with a goal of improving an MIS project's risk management effectiveness. Specifically, the method will provide the means of mitigating or identifying risks for mitigation for the MIS project. A classification of those risks would find risks assigned in all four quadrants of the Keil *et al.* risk framework.

The proposed TSSO method includes the following steps:

- Identify Strategic Initiative
- Define Target State Specific Outcome (TSSO) Model
- Understand Strategic Initiative Design
- Identify MIS Objectives
- Create MIS High-Level Definition
- Create MIS Project Plan

IDENTIFY STRATEGIC INITIATIVE

Software projects are most effectively scoped based on the driving strategic initiative and not from the perspective of a requested software solution. Software development projects typically start with a request for a software solution from the organization. Using an example from Kaplan and Norton (Kaplan & Norton 2004), assume that the organization requests a "crew scheduling system". The crew scheduling system refers to an MIS necessary for an airline to schedule all tasks to prepare an arriving plane parked at a gate for departure from that gate. While this "crew scheduling" project may seem clear enough to the team, simply stating the software solution is not enough information to appropriately scope the MIS project.

For example, it would be possible to come up with numerous requirements for an airline ground crew scheduling system. However, knowing the objective as stated in the strategic initiative is to achieve thirty minute airplane turnaround makes the project expectations more clear. Thus, the MIS must enable the organization to achieve thirty-minute ground turnaround. Delivering a crew scheduling system and not achieving thirty-minute ground turnaround cannot be seen as a successful project (even if delivered on time and under budget).

Identifying the strategic initiative for the MIS project, instead of starting with the requested software solution, will help to mitigate the risks within the Customer Mandate and Scoping and Requirements quadrants of the risk framework. Assuming that management is committed to the strategic initiative and that management has secured the commitment of the eventual users of the MIS for the strategic initiative and the MIS project is required to achieve the initiative, then the MIS project should have the commitment of management and users. These assumptions reduce the Customer Mandate risk for the project and this alignment with the strategic initiative prevents management or users from perceiving the MIS project as anything less than a requirement for achievement of the agreed strategic initiative. Identifying the strategic initiative as the purpose for the MIS improves understanding of why the MIS is being built and permits the project team to understand the organizational objectives on which to focus, thus reducing Scoping and Requirements ambiguity and uncertainty risks.

In taking this first step within the TSSO model, it is clearly communicated that the project boundary is not the software solution requested by the organization, but the strategic initiative. That is not to say that the scope of all MIS projects should be increased, but it is to say that the MIS scope must be defined such that the organization can make explicit informed decisions about what MIS support will and will not be included in the MIS. The MIS scope must clearly show how the MIS is critical to the success of the strategic initiative and communicate the risks of declining MIS support to the strategic initiative.

DEFINE THE TARGET STATE SPECIFIC OUTCOME (TSSO) MODEL

An important element in MIS project scoping and the purpose of the proposed TSSO model is to formulate the problem and define its context. The proposed TSSO model is a hierarchy of objectives model that identifies business outcomes that must be achieved in order to achieve the strategic initiative. The technique does not imply methods for outcome achievement and leaves the organization free to explore, select, and design solutions. In this way, the TSSO approach ensures communication and collaboration with the organization, reduces barriers of communication, and increases goal understanding.

The proposed TSSO model is a hierarchical model that identifies sub-outcomes that must be achieved before the higher-level outcome can be achieved. Multiple levels of dependency can be defined for each outcome. A TSSO model has the following characteristics:

- Stated unambiguously – an outcome is designed to reduce or eliminate ambiguity
- Stated in past, or current, tense as though the outcome has already been achieved
- Stated in terms of a specific business concept
- Stated in terms of a specific state, or condition, of the business concept

The proposed TSSO model is an extension of Kaplan and Norton's third-generation balanced scorecard model (Kaplan & Norton 2004). Multiple levels of detail can be defined, but it is proposed that one level is sufficient to meet the goals of MIS project scoping. Focus must be on outcomes whose process must change in order to achieve the strategic initiative. An example of a single-level TSSO model for the TSSO Model for Achieve Fast Turnaround Example is shown in Figure 3.

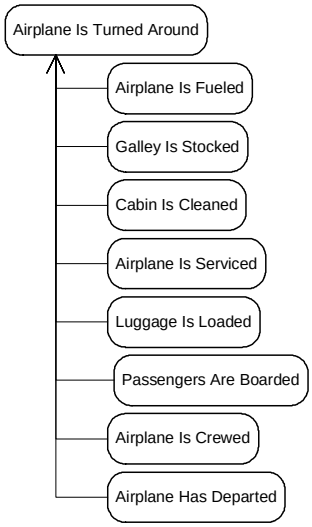

Figure 3: TSSO Model for Achieving Fast Turnaround Example

The TSSO model improves understanding of why the MIS is being built and helps the project team understand the business outcomes that the MIS must support. Specifically, the scope and requirements must support the outcomes identified in the TSSO model. This does not mean that all imaginable support will be included in scope and requirements, but it does provide a broad outline from which scope and requirements will be defined and decisions made about what must be included in project scope.

The TSSO model reduces risks from the Scoping and Requirement risk quadrant of the risk framework. The identification of outcomes that will be supported by the MIS reduces risk by addressing bounded rationality (ambiguity and uncertainty) for the project Specifically bounded rationality is addressed by "replacing abstract, global goals with tangible sub-goals, whose achievement can be observed and measured" (Simon 1979) using the construct of a target state specific outcome. In the example, the abstract goals are "crew scheduling system" for the MIS project and "fast ground turnaround" for the strategic initiative. In this example, those abstract goals are broken down into sub-goals as shown in Figure 3: TSSO Model for Achieving Fast Turnaround Example.

UNDERSTAND STRATEGIC INITIATIVE DESIGN

The completed TSSO model does not imply methods for outcome achievement and leaves the organization free to explore, select, and design the approach to achieving the strategic initiative, but MIS project scoping will require additional information about the chosen business solution for the achievement of each TSSO. The required additional information is the business design characteristics of each TSSO. The sum of all these characteristics for the strategic initiative comprises the strategic initiative design that must be understood before an MIS project scope can be defined. The operational organization that does the work of achieving the outcome (e.g., the department responsible for fueling the airplanes) determines the business design characteristics of each TSSO (e.g., Airplane is Fueled).

A TSSO's business design characteristics document differences between the current outcome's achievement approach and the future approach that will support the higher-level outcome (Airplane is Turned Around) and support the objective and measures of the strategic initiative. If the outcome is new, the characteristics will define the new outcome's solution. The business design characteristics used in the TSSO method are derived from Kaplan and Norton's "Internal Perspective" and the Human Capital, Organization Capital, and Information Capital from the "Learning and Growth Perspective" (Kaplan & Norton 2004). The Kaplan and Norton framework is extended to include the environment (External Characteristics) as suggested by System Theory's "environmentalization problem" (Ackoff 1974). The TSSO business design characteristics are:

- Definition – What is the meaning of the outcome and "what must change" to achieve the strategic initiative?
- Responsibility – What role is responsible for outcome achievement?
- Measurement – What must be measured to ensure achievement of the strategic initiative?
- Changes/Risks/Issues/Barriers – What are the changes, risks, issues, and barriers in each of the following categories that must be made, addressed, and surmounted to achieve the strategic initiative?
    - Facilities, equipment, tools, processes, and techniques (Internal Perspective)
    - People, skills, and training (Human Capital)
    - Culture, leadership, motivation, and teamwork (Organization Capital)
    - Information and technology infrastructure (Information Capital)
    - External factors (Environment)

Upon completion, the business design characteristics are summarized in a table. An example of a strategic initiative design table is shown in Figure 1: Abbreviated Strategic Initiative Design, which was abbreviated to a single TSSO, "Luggage Is Loaded", due to space limitations in this paper. Management and the responsible organizations review this initial strategic design in order to eliminate conflicts and ensure validity of overall design. Several iterations of the strategic design may be required in order for management and the responsible organizations to agree on a satisfactory strategic initiative design.

Understanding the strategic initiative design will reduce risks in three of the four risk framework quadrants. Customer mandate risk is reduced by identifying and understanding the needs of the MIS users (e.g. Baggage Handling Crew in the Responsibility column of Figure 4). Scope and requirement ambiguity and uncertainty risks are reduced or identified by understanding the business solution characteristics (e.g. "Connecting flight luggage" is the biggest issue in the Facilities, Tools, Equipment, Processes and Techniques column of Figure 4). Environment risks for the MIS project are reduced through resolution of business design conflicts that become apparent when the characteristics are summarized (e.g. the Culture, Leadership, Motivation and Teamwork column implies that there could be a problem with cooperation and commitment from Baggage Handlers in Figure 4). Environment risks can be identified in the External Factors characteristics (e.g. Figure 4 (External Factors column) notes the possibility that "this will increase baggage train traffic on the ramp that could be an issue with the ramp safety staff.").

This step in the TSSO method may appear to exceed the scope of the MIS project that was requested. However, it is necessary to ensure that the MIS project is driven by delivering the software support that will enable achievement of the strategic initiative and not driven by the software solution that was initially requested. The only way to provide management with the explicit information required to appropriately define the MIS project's scope (include and exclude items from scope) is to first understand the strategic initiative design.

IDENTIFY MIS OBJECTIVES

Within the proposed TSSO process, the MIS project objectives are then identified using the strategic design. While particular attention is paid to the Information Technology component, the MIS project team will review each cell of the strategic initiative design (see Figure 4: Abbreviated Strategic Initiative Design) and identify the MIS objectives. Identification of MIS objectives must focus closely on the measurement goals that the strategic initiative is trying to achieve and identify measurements that show how the MIS contributes to those overall measurement goals. Clear statements should be built into the value proposition for the MIS project that describe which measurement goals cannot be achieved without the support of the MIS. These objectives identify the MIS support required for each component of the strategic design.

The identified MIS objectives will be reviewed with the responsible organizations to identify and resolve conflicts and issues. This negotiation is part of the organizational collaboration that will improve overall coordination of the strategic initiative implementation. Conflicts that cannot be negotiated to resolution are passed to management for review, resolution, and prioritization.

Airplane is Turned Around	Definition	Responsibility	Measurement	Facilities, Tools, Equipment, Processes, and Techniques	People, Skills, and Training	Culture, Leadership, Motivation, and Teamwork	Information and Technology	External Factors
Luggage Is Loaded	Offloading arriving flight luggage and cargo and loading departing flight luggage and cargo.	Baggage Handling Crew	Supervisors measure random flight baggage times Critical measures are unload luggage in 8 mins, load departing luggage in 8 mins, load connecting luggage in 8 mins and with 6 mins contingency	Connecting flight luggage is biggest baggage issue. Change process and increase current equipment. That could increase baggage train equipment requirements by 15%.	After process change, hire some additional people (probably one per active gate) to specifically handle connecting flight baggage. Train baggage crew on new process.	Motivation might be improved via posting of baggage crew rankings (with a small monthly bonus for highest ranking crew) and a periodic crew shuffling to strengthen weak handlers and crews	Create connecting baggage plan per flight and deliver to arriving flight connecting baggage handler. Identify large, tight, or special handling requirements	This will increase baggage train traffic on the ramp that could be an issue with the ramp safety folks

Figure 4: Abbreviated Strategic Initiative Design

Airplane is Turned Around	Definition	Responsibility	Measurement	Facilities, Tools, Equipment, Processes, and Techniques	People, Skills, and Training	Culture, Leadership, Motivation, and Teamwork	Information and Technology	External Factors
Luggage Is Loaded	Create connecting baggage plan per flight and deliver to arriving flight connecting baggage handler. Identify large, tight, or special handling requirements	CIO	Baggage supervisor to record random times for process improvement.	Must identify equipment shortages in schedule. Facilitate change in process and base connecting baggage system on new process.	Update baggage supervisor training to measure random crew times. Update supervisor and crew training for new scheduling system.	Include crew assignment and rankings in system.	Deploy durable handheld devices and wireless network to ramp. Prove communications non-interference. New interface to HR Motivation system.	Review and update gate assignment algorithm in flight ops system to minimize this issue.

Figure 5: Abbreviated MIS Objectives

Airplane is Turned Around	Information and Technology	Responsibility	Schedule	Facilities, Tools, Equipment, Processes, and Techniques	People, Skills, and Training	Culture, Leadership, Motivation, and Teamwork	Information and Technology	External Factors
Luggage Is Loaded	Create connecting baggage plan per flight for arriving flight connecting baggage handler. Identify large, tight, or special handling requirements	Ground Scheduling System	Schedule: 180 day duration Resources: 1 analyst/1mth, 1 tech arch/1mth, 3 developers /3mth, & 2 testers/1mth	Will require handheld devices and wireless network on the ramp due to frequent updates required to keep plan current. Automation will sigrificantly change process.	Train 5 developers in wireless implementations for handheld devices before project start. Must train all connecting baggage handlers in new process and system.		Deploy durable handheld devices and wireless network to ramp to use new baggage scheduling subsystem. Prove communications non-interference.	Airport authority approval required for new wireless network on the ramp. Approval time could create significant deployment risk
	Feed crew rankings and crew assignments to HR system and implement new motivation program.	HR Motivation Programs System	Schedule: 30 day duration Resources: 1 analyst/1wk, 1 tech arch/2dy, 1 developer/2wk, & 1 tester/1wk	Implement crew motivation program process	Communicate to and train crew on motivation program		Create new interface between Ground Scheduling System and HR Motivation Programs System	Resolve any union contract issues
	Baggage supervisor to record random times for process improvement. Ground Crew Director (GCD) to record missed time, not actual time.	Ground Turnaround Metrics System	Schedule: 45 day duration Resources: 1 analyst/2wk, 1 tech arch/1wk, 1 developer /3wk, & 1 tester/3wk	Add metric recording steps to baggage supervisor process Add metric recording steps to GCD process	Will have to train all baggage supervisors in metric recording process Update GCD training for metric recording		Will require GCD and baggage supervisor to have mobile automation	Airport authority approval required for new wireless network on the ramp.

Figure 6: Abbreviated MIS High-Level Definition

Continuing to extend the previous example, the MIS objectives for the thirty-minute ground turnaround example are shown in Figure 5: Abbreviated MIS Objectives. Due to space limitations, only the MIS objectives are shown in the cells, but a more comprehensive approach would have the team provide feedback to the other responsible organizations on each cell based on their perspective of what will be required to achieve the strategic design. Objectives identified in this manner will insure that the MIS project is supportive of the entire strategic initiative.

MIS project objectives that are based on the strategic design of the operational organizations will reduce MIS project risk. Negotiation of the MIS objectives with the operational organizations should improve the relationships and reduce Customer Mandate risks since those organizations will know that they have been heard and included, whether or not they get everything that they want. The identification of specific MIS objectives as shown in Figure 5: Abbreviated MIS Objectives will reduce scope and requirement ambiguity and uncertainty risks.

CREATE MIS HIGH-LEVEL DEFINITION

In this proposed TSSO step, a high-level definition of the MIS is derived from the list of MIS objectives. First, each MIS objective is assigned to an existing, or to be built, MIS and each assigned MIS is paired with the TSSO for which it will provide support. More than one MIS is commonly associated with a TSSO since interfaces between MIS's are commonly objectives and functionality for an objective may require features from more than one MIS.

Each of the assigned MIS's will explore, select, and provide a general solution definition to achieve the objective within the context of the strategic initiative. Characteristics of the definition are similar to the characteristics defined in the strategic initiative design. The difference is that the characteristics defined in the MIS High-Level Definition will be from the perspective of the needs and implications of the final MIS that supports the strategic initiative. The characteristics for the MIS High-Level Definition include:

- Outcome – What TSSO is being supported?
- Information and Technology – What is the objective?
- Responsibility – What MIS is responsible for supporting outcome achievement?
- Schedule – What is the expected duration of the task, or project, necessary to deliver the appropriate support for outcome achievement?
- Changes/Risks/Issues/Barriers – What are the changes, risks, issues, and barriers in each of the following categories that must be made, addressed, and surmounted to achieve the MIS objective?
    - Facilities, tools, equipment, processes, and techniques
    - People, skills, training, motivation, and compensation
    - Culture, leadership, motivation, and teamwork
    - Information and technology infrastructure
    - External factors

These characteristics should improve the accuracy of project estimates and plans than would be possible without the focus, context, and additional levels of detailed information provided by this TSSO step. Figure 6 (Abbreviated MIS High-Level Definition) further extends Kaplan and Norton's Airplane Turnaround example to illustrate this high-level definition step. The MIS High-Level Definition will be reviewed with the other responsible organizations to identify and resolve conflicts, issues, and barriers to implementation. This negotiation is part of the organizational collaboration that will improve overall coordination of the implementation. Conflicts that cannot be negotiated to resolution are passed to management for review, resolution, and prioritization.

The creation of an MIS High-Level Definition can reduce Execution and Environment risks. Execution risks can be reduced based on the additional detailed information about the MIS objectives. Specifically, objective-based responsibility assignment, schedule, budget, and people estimates, skill and training requirement identification, and technology requirement identification as shown in Figure 6 should lead to better planning, which should reduce execution risks. Environment risk mitigation plans can be initiated based on the External Factors column of Figure 6.

CREATE MIS PROJECT PLAN

The MIS project team will create a plan using the MIS High-Level Definition after conflicts and priorities have been resolved and suitability to the strategic design has been approved. Schedules, budgets, resources, risk mitigation plans, and other artifacts of MIS project management will be created. The definition of the solution and resolution of conflicts through negotiation, and collaboration ensures that this plan supports, aligns, and integrates with the strategic initiative

implementation as a whole. The authors chose to limit this paper to MIS project scoping activities which is why this section does not contain more detailed information about MIS project planning.

Implications / Conclusions

The proposed method provides the required information on which to build MIS project estimates and to demonstrate the alignment, integration, value (through measures) of the proposed MIS with regards to the strategic initiative. This method also provides the ability to reduce risks as defined by the four quadrants of the Keil *et al.* risk framework. One difficulty with implementing this approach is the fact that organizations tend to simply request a solution and ask for an estimate to build the solution. Performing the necessary analysis of the problem domain that is required to create this estimate and verify that the requested solution is, in fact, the appropriate solution may be a difficult proposition. This approach may be viewed as "too much" when what is requested from the organization is a software solution. However, IT organizations must ensure that they are delivering the appropriate solution and those solutions must deliver enough value when balanced against the solution's cost. IT organizations must also provide some means of improving project success by identifying and managing project risks. The proposed method provides that assurance of solution appropriateness and value and provides a means of reducing project risks that can improve project success.

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